

SECTION 14

BODY

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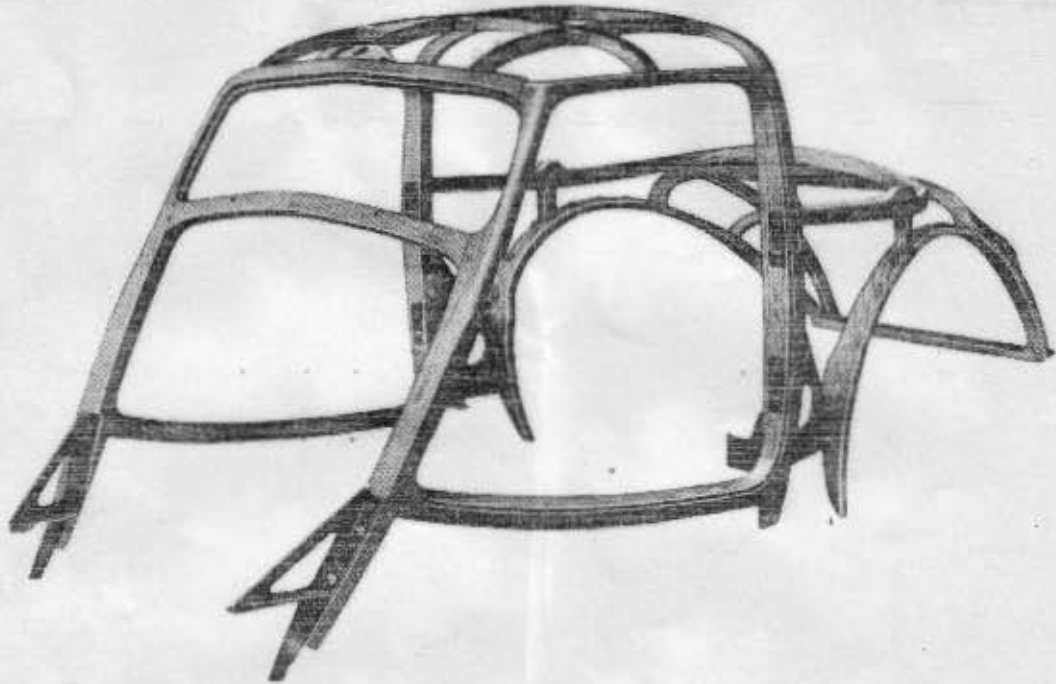


Fig. 1. Basic Body Structure

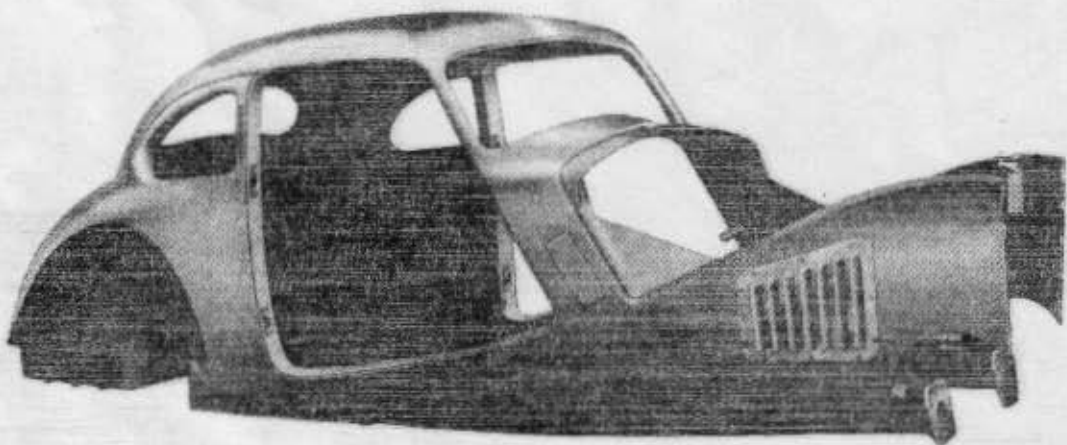


Fig. 2. Complete Body Structure.

B O D Y

T Y P E 4 0 0

BODY STRUCTURE

The body structure consists of an ash and spruce basic structure mounted on the chassis frame, over which is built the steel body shell. The basic structure is illustrated in Fig.1.

The door hinge pillars are used as a datum for the structure, and from these pillars the door cant rails and the rockers extend forward to the door front pillars, these being braced by the right and left-hand windscreen rails and canopy rails. A triangular steel bracket is bolted to the front face of each door front pillar and serves to attach the front of the structure to the chassis side members. Transverse roof members are fitted between the two door hinge pillars and also at a location midway between the pillars and the canopy rails. The members are strengthened by three longitudinal rails. The two transverse members and the left and right-hand longitudinal rails are felted on their top surfaces to prevent hard contact with the roof panels, when fitted.

Two elbow members (which form the quarter light sills) extend rearwards from the door hinge pillars and are jointed by the back rail of the structure, the boot structure extending from the rear of the rail.

Two large steel brackets are bolted to the hinge pillars below the elbow members and serve to attach the rear of the structure to the chassis frame. The laminated wood rear wheel arches are bolted to the rear faces of the brackets, the

rear ends of the arches being secured to the lower cross rail of the boot structure, and strengthened by wooden side rails and battens secured to the elbow members and to the upper cross rail and main side members of the boot structure. Captive nut units are fitted around the periphery of each wheel arch and provide attachment for the rear wings.

The basic body structure is mounted on the chassis frame, and the steel attachment brackets fitted to the front and rear door pillars are welded to the chassis side members. The entire wood structure is treated with wood preservative before the panels of the body shell are fitted.

The complete wood structure is covered with steel pressings which are welded and clinched into position, thereby forming the body shell. The combined scuttle and louvred side valances are riveted to the chassis side members and butt-welded to the body shell panels, see Fig.2.

The front and rear wings are separate detachable parts and are bolted to the body structure.

WINGS

Description

The front and rear wings are of steel construction and are bolted into position. Each front wing embodies one half of the radiator cowl and extends rearwards to the rear wing. Although wings are visually the same on all type 400 cars, the internal diaphragms of the front wings may vary in some cases to suit the fitment of wide type air intake valances. The chassis number must therefore be quoted when ordering replacement wings.

Replacing front wings

The sequence of operations for fitting a replacement wing to a type 400 car incorporating narrow type side valances is outlined in the following paragraph; this is followed by an outline of the additional operations necessary when fitting a wing to a car with wide type valances.

It is assumed that the other front wing is in a serviceable condition, and every care should be taken to "match" the replacement to this wing. A replacement front wing, as supplied by the manufacturer, is illustrated in Fig.3. Proceed as follows :-

1. Remove the front four set-bolts securing the corresponding rear wing to the wheel arch and wedge the wing away from the car body.
2. Offer the replacement wing into position and join both front wings at the radiator cowl junction, interposing the medallion and starting handle aperture fairings.
3. Locate the wings at the top of the radiator, then temporarily fit the bonnet and check the length of the bonnet hinge strip relative to the wing position.
4. Locate the wing to the engine compartment side valance, drilling pilot holes only in the attachment flange of the replacement wing.
5. Check the rear portion of the wing relative to the rocker panel contour below the door sill and, if necessary, mark off, remove the wing and set to contour.
6. Refit the wing, check its length relative to the rear wing, mark off, remove the wing and trim to length.
7. Butt-weld the end plate into position and refit the wing.
8. Mark the position of the rocker panel nut cages on the rear securing flange of the wing.
9. Remove the wing and open out the pilot holes for the bolts which will secure the forward portion of the wing to the side valance. Fit a length of replacement beading to the

- wing at its junction with the car body. Refit the wing to the car, securing it to the rocker panel and side valance with set-bolts and plain washers.
10. Check the fit of the radiator grille in its aperture; a good fit with a small even clearance between the grille and cowl is required. If necessary, lead-fill and trim the aperture rim of the replacement wing to satisfy this requirement.
 11. With the grille positioned correctly, mark the position of the two securing screw holes, remove the grille, drill the two holes and weld the retaining nuts in position at the rear of the aperture rim.
 12. Offer the cowl attachment bracket to the front face of the bumper mounting bracket. If necessary, trim the attachment bracket, then bolt it to the mounting bracket and tack-weld to the inside of the wing.
 13. Offer the centre diaphragm into position on the underside of the wing, trim as necessary then bolt it to the rocker panel and tack-weld to the wing.
 14. Tack-weld the stay channel into position.
 15. Cut in the wing the apertures for the jacking point access, the bumper attachment bracket, and the starting handle.
 16. Offer the front diaphragm into position between the side valance, the bottom diaphragm and the wing. If necessary, mark and trim the front diaphragm to fit the contour of the wing, then bolt the diaphragm to the side valance and the bottom diaphragm and tack-weld it to the wing.
 17. Remove the wedge, holding the rear wing clear of the body, re-position the wing, and fit and tighten the set-bolts and washers which were removed previously.
 18. Check the head lamp face for vertical and set, then trim the aperture to size and drill the mounting bolt holes.
 19. Mark the position and drill the holes for the side lamp mounting bolt holes and the electrical cable aperture.
 20. Mark the position of the two chromium-plated trimming strips on the wing, then drill eight holes along each line for the special strip retaining bolts at approximately 7in. pitches.
 21. Paint the wing to match the car.
 22. Fit the head and side lamps and connect up the electrical cables, then adjust the head lamps as described in Section 13.

23. Fit the two chromium-plated trimming strips to the wing, using the corresponding wing as a guide to location.
24. Assemble a new length of bonnet tape around the bonnet aperture of the wing, securing it with "Parker-Kalon" screws.
25. Finally, fit the radiator grille, together with the medallion and starting handle aperture fairings.

The following paragraph outlines the sequence of operations required when a replacement front wing is to be fitted to a car incorporating wide type engine compartment side valances. The additional items required are illustrated in Fig.4.

1. Proceed as described in the foregoing items 1 to 16 inclusive, then carry out items 18 to 21 inclusive.
2. Bolt the centre and side radiator cowl diaphragms into position, then offer the front diaphragm into position and, if necessary, mark and trim the diaphragm to suit the contour of the wing.
3. Bolt the diaphragm to the engine side valance and to the cowl side diaphragm, and tack-weld it to the wing.
4. Offer the diaphragm stay between the diaphragm and the front end of the side valance, mark and drill the bolt holes, then bolt the stay into position.
5. Complete the fitting operation by carrying out items 22 to 25 given previously.

Replacing rear wings

Replacement rear wings are supplied undrilled, and must be offered to the car and the mounting bolt locations marked, every endeavour being made to "match" the replacement with the corresponding rear wing.

When ordering a replacement wing, details of the type of protective spat required must be stated, since either a ribbed rubber sheet spat or a polished

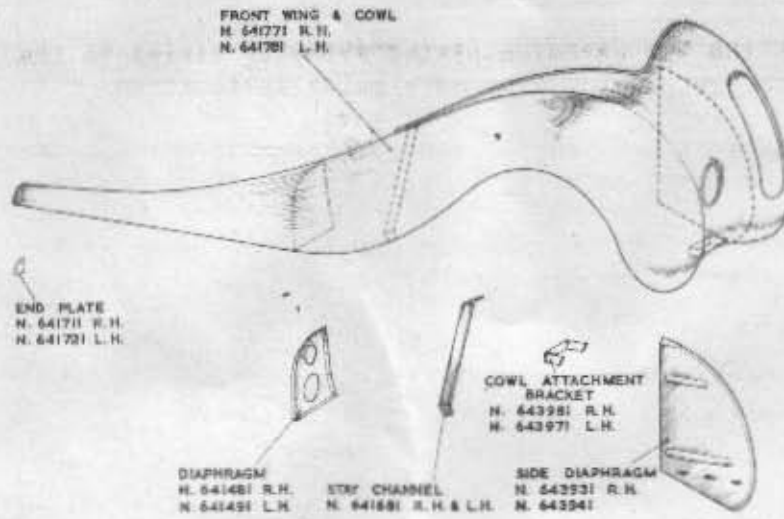


Fig. 3. Front Wing Details.

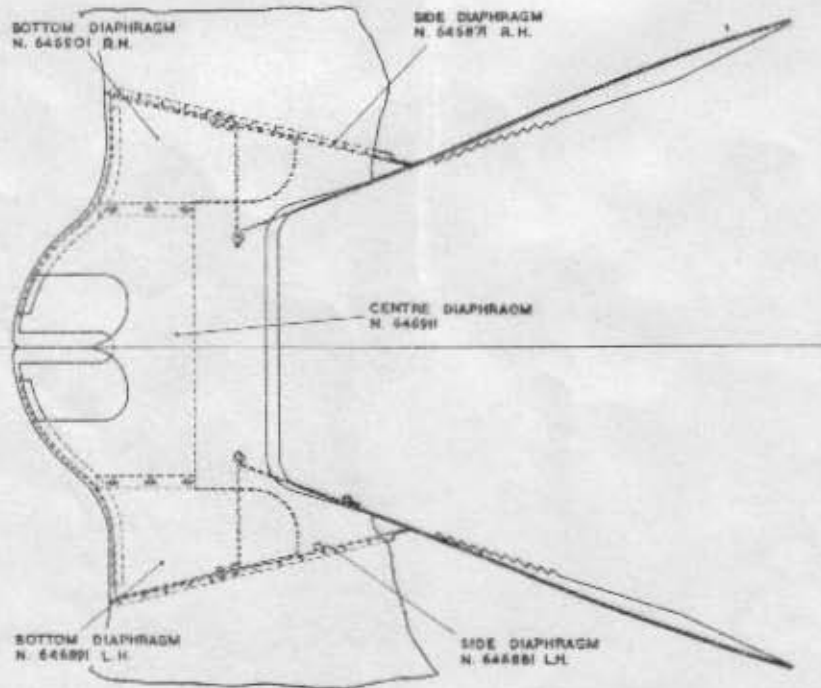


Fig. 4. Wing Details (Wide type side valances).

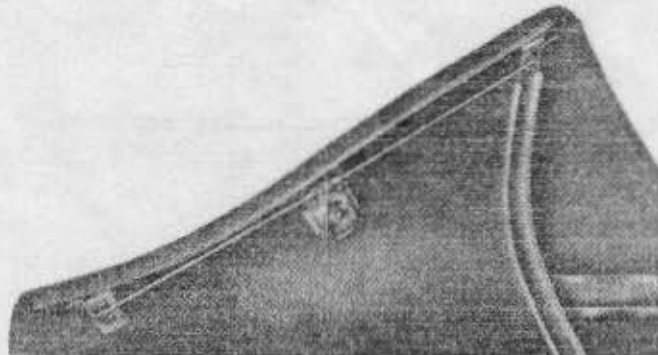


Fig. 5. Bonnet Lock Mechanism.

metal spat can be supplied. The sequence of fitting operations is outlined herewith.

1. Remove the unserviceable wing and clean away all dirt accumulation from the wheel arch and wheel arch panel.
2. Mark the position of the wing retaining bolt holes in the wheel arch on the wheel arch panel, so that when the wing is fitted their positions in the wing can readily be determined.
3. Clamp the replacement wing to the car body, adjusting its position to match the corresponding rear wing.
4. Mark the position of the mounting bolt holes in the wing, then remove the wing and drill the holes. Elongate each hole to provide adjustment when the wing is finally assembled to the car.
5. Refit the wing to the car and secure with the set-bolts and plain washers, tightening the front set-bolts first, and working rearwards. Check the wing for satisfactory matching with the corresponding rear wing, then mark a line on the wing to coincide with the body contour; detach the wing.
6. Fit the protective spat to the wing. If this is of the ribbed rubber sheet type, clean the locations thoroughly and assemble the spat to the wing with "Bostik" adhesive, maintaining pressure on the spat until the adhesive has set. If, however, the spat is of the polished metal type, this must be clinched into position over the front face of the wing. Drill through the spat if it has obstructed any of the wing mounting bolt holes.
7. Fit a length of replacement beading to the wing, making sure that the bead conforms to the contour line marked on the wing.
8. Refit and secure the wing to the car, then bolt the wing stay to the side of the boot and tack-weld it to the inside face of the wing.
9. Using the corresponding rear wing as a guide, mark the position of the stop and reverse lamp unit bolt holes; drill the holes.
10. Paint the wing to match the car, taking care to mask the protective spat.
11. Fit the stop and reverse lamp unit and connect up the electrical cables.

BONNET

Description

The 18 S.W.G. light-alloy bonnet comprises left and right-hand panels, the panels being hinged on the centre line. Angle strip reinforcing pieces are welded to the underside of each panel. The bonnet catches consist of a single external handle in each panel which operates catch rods through a rocking lever system, see Fig.5, the rods engaging adjustable hooks mounted on the side valances. A lock is incorporated in each handle.

A jointed stay retains the bonnet in position when opened.

Maintenance

Periodically clean all dirt accumulation from the bonnet locks and stay joints and lubricate all joints with grease. Lubricate the bonnet hinges with engine oil.

Adjusting bonnet catches

Bonnet rattles are generally attributable to worn bonnet tape, catch hooks or rods, a distorted panel or a combination of all these defects. If the bonnet tape is frayed badly, replacement tape will normally effect a cure. Where the tape is not worn badly, the bonnet catch hooks must be adjusted to compensate for the wear in the catch mechanism or for slight distortion of the bonnet panel(s).

To adjust the rear catch hooks, release the lock-nut and move the catch along its slot; retighten the lock-nut. Adjust the front catch hooks by

regulating the position of the adjusting nut and the lock-nut on the catch hook thread to raise or lower the hook(s). Make sure that all lock-nuts are tight, then close the bonnet panel(s) and check that the lock engages effectively and that the panel is held firmly against the bonnet tape without distortion.

Removing and refitting bonnet

To remove the bonnet proceed as follows :-

1. Open one side of the bonnet and remove the countersunk screws securing the bonnet hinge plates to the radiator shell and scuttle, then disconnect the stay from the bracket on the underside of the bonnet panel and lower the panel:
2. Open the other side of the bonnet, remove the two remaining hinge plate securing screws, disconnect the bonnet stay and remove the bonnet.

To refit the bonnet, carry out the foregoing operation in the reverse sequence.

Replacing bonnet

In the event of damage, it should be noted that bonnet panels are made to suit each individual car. Assembled replacement panels cannot be supplied, and it will be necessary to hinge and fit a new panel pressing, and from that stage to weld into position the stiffeners and to fit the locking mechanism.

RADIATOR GRILLE

Description

The grille is secured to the bonnet shell by four cheese-head 2 B.A. set-screws, which pass through lugs on the inside face of the shell and engage 2 B.A. nuts welded to the rear face of the lugs, see Fig.7.

Removing and refitting

Take care when handling the grille, since it can easily be damaged. To remove the grille, unscrew the four 2 B.A. cheese-head set-screws shown in Fig.7 and draw the unit forward away from the radiator shell.

When refitting the grille, tighten the set-screws evenly and in turn to prevent distorting the unit.

Replacing grille

A completely finished radiator grille can be supplied, but attention must be paid to the following points. The space between the radiator shell aperture and the original was filled with lead to obtain snug fitment of the grille. Removal of this filling or the addition of more filling may therefore be necessary to suit the replacement grille. Consequently, the operation should be carried out with care or considerable difficulties may be encountered.

BUMPERS

Description

Two types of front and rear bumpers have been produced. The first type is of tubular construction and is fitted only to a few cars. This type of bumper is now obsolete and no spares can be supplied. Where replacement components are required, the second type of bumper assembly described in the subsequent paragraphs and illustrated in Fig.8 must be fitted.

The front and rear bumpers are similar, and comprise a pressed-steel bumper bar bolted to inner and outer springs (see Fig.9), with two pressed-steel

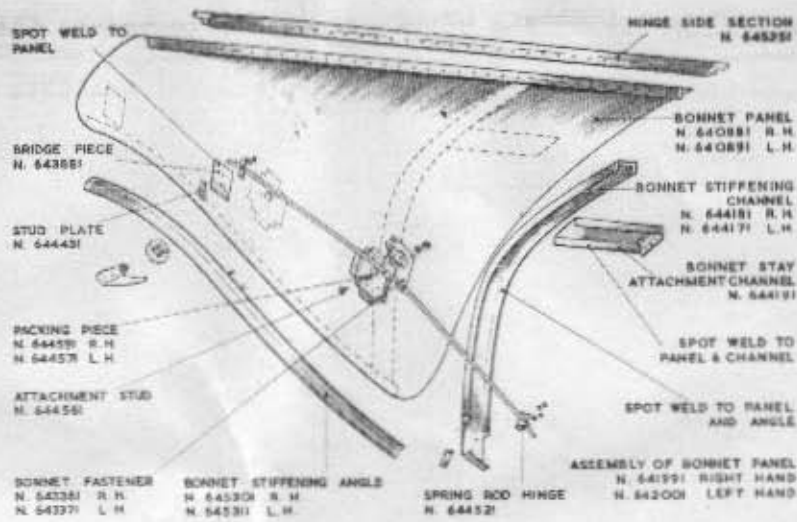


Fig. 6. Bonnet Panel Details.

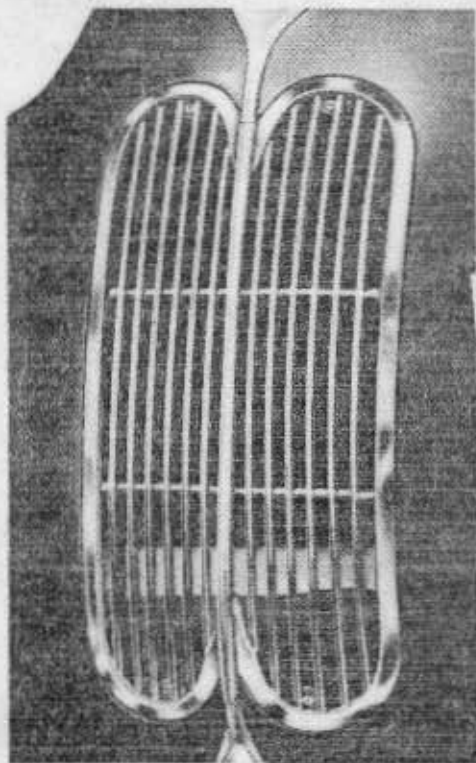


Fig. 7. Location of Grille Securing Screws.

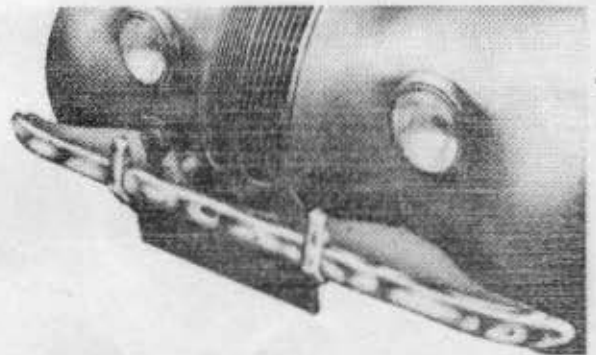


Fig. 8. Front Bumper Details.



Fig. 9. Front Bumper Details (Valance removed).

over-riders bolted to the bar. The bolts also serve to secure the bumper bar to the inner spring and to mount the registration plates. Brackets bolted to each bumper and inner spring provide mountings for sheet aluminium-alloy valances which are shaped to conform with the front and rear contours of the body, the valances being secured to the brackets with dome-head bolts, plain washers and $\frac{5}{8}$ in. B.S.F. nuts.

The front bumper springs are attached to the chassis frame by two welded tubular brackets. The brackets pass through apertures in the wings and are bolted at the rear to box-section mounting brackets which are secured to the front face of No.1 chassis cross-member, as shown in Fig.10. The tubular brackets are faired into the wings by split metal cuffs which are held in position by two 4 B.A. bolts, washers and nuts, the cuffs gripping the brackets at the front end and rubber beading forming a seal against the wings at the rear. The cuffs can be seen in Fig.10.

The rear bumper is mounted in a manner similar to the front unit, but the brackets are secured to the chassis rear extensions. The right-hand mounting bracket incorporates an attachment lug to which is secured the exhaust tail pipe support clip.

Removing and refitting bumpers

Removing and refitting methods are common to both front and rear bumpers except that, when removing the rear bumper, the electrical leads to the registration plate lamp must first be disconnected.

1. Remove the six $\frac{5}{8}$ in. B.S.F. dome-head bolts, spring washers and nuts securing the valance to the four brackets on the bumper bar and the two brackets on the inner spring, and lift away the valance.

2. Support the bumper and remove the two $\frac{5}{8}$ in. B.S.F. bolts, spring washers and nuts securing each inner and outer spring to the tubular brackets, removing the two valance attachment brackets as the rearmost retaining bolts are withdrawn. Withdraw the bumper assembly, complete with registration plate and carrier, clear of the brackets.

To refit the bumper, reverse the foregoing sequence, but take care when offering the assembly to the tubular brackets, to engage the bracket plate between the butting faces of the inner and outer springs.

Removing and refitting front bumper mounting brackets

If it is required to remove the mounting brackets due to damage, proceed as follows :-

1. Remove the bumper assembly as described under the previous heading.
2. Remove the two $\frac{1}{2}$ B.A. bolts, washers and nuts securing each cuff around its bracket, then spring the cuffs open carefully and remove them from the brackets.
3. Remove the three bolts, washers and nuts securing each bracket to the front attachment plate of its box-section mounting bracket, then withdraw the bracket forward through the aperture in the wing.

To refit the brackets, reverse the foregoing sequence.

Removing and refitting rear bumper mounting brackets

To remove the brackets, remove the rear bumper assembly as described previously, then remove the three bolts, washers and nuts securing each bracket to the side walls of the boot, and withdraw the brackets rearwards.

Reverse this sequence to refit the brackets.

Dismantling bumpers

The method of dismantling is common to both front and rear bumpers. Proceed as follows :-

1. Remove the $\frac{3}{8}$ in. nut and spring washer from the dome-head bolt at each end of the bumper bar, and detach the valance attachment brackets, followed by the outer springs and packing pieces; withdraw the bolts.
2. Detach the over-riders by removing the $\frac{3}{8}$ in. nuts and spring washers from the securing bolts.
3. Remove the nuts and spring washers from the two remaining dome-head bolts, remove the registration plate carrier complete with mounting brackets, then separate the bumper bar and packing pieces from the inner springs.

Re-assembling bumpers

1. Fit dome-head bolts (head outwards) to the two innermost holes in the bumper bar, locate one of the packing pieces over the bolts, then assemble the inner springs to the bumper.
2. Locate the mounting brackets of the registration plate over the bolts, then fit the spring washers and screw on the nuts sufficiently to retain the assembly.
3. Fit a packing piece between each inner spring and the bumper bar at the over-rider locations, make sure that the bolt holes are aligned, then fit the over-riders, securing with the spring washers and nuts. Tighten all nuts securely.
4. Fit the two remaining dome-head bolts to the outermost holes in the bumper bar, then assemble the remaining packing pieces to the bolts, followed by the outer springs, the valance attachment brackets, and finally the spring washers and nuts. Tighten the nuts securely.

Replacing bumper valance

All replacement valances for the front and rear bumpers are supplied undrilled and unpainted. It will therefore be necessary first to fit and trim the valance to suit the contour of the car, then to drill the attachment bolt holes, and finally to paint the valance to match the car.

WINDSCREEN

Description

The windscreen consists of two $\frac{1}{4}$ in. thick laminated glass panels, rubber-mounted in a plated brass frame and divided by a centre rail. The frame is split laterally into two sections, the sections being held together by a tie-plate on each side and a third plate situated centrally on the screen centre rail. Fourteen wood-screws passing through attachment angles brazed to the flange of the screen frame secure the assembly in position, a moulded rubber section retained in the frame outer channel forming a water-tight and draught-proof seal with the aperture frame. A sectioned view of the windscreen is shown in Fig. 11, and illustrates the two types of sealing strip employed.

Removing and refitting

To remove the windscreen, proceed as follows :-

1. Detach the windscreen wiper arms.
2. Remove the grub-screw from the shank of the trafficator switch lever and remove the lever.
3. Remove the twelve raised-head "Parker-Kalon" screws and detach the windscreen top, bottom and side finishers carefully.

TUBULAR BRACKET
CUFF



Fig. 10. Front Bumper Mounting Bracket Details.

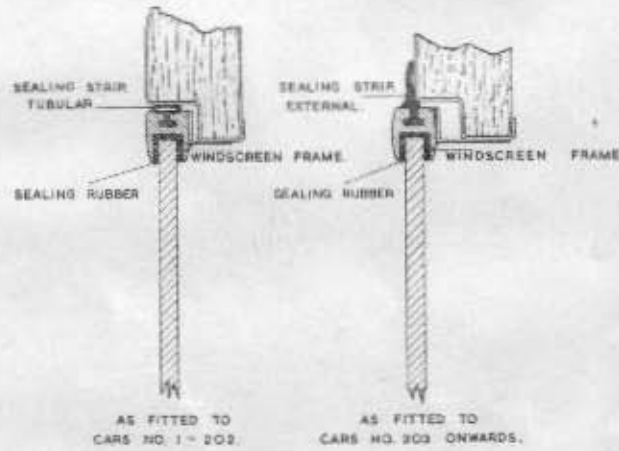


Fig. 11. Sectioned view of Windscreen.

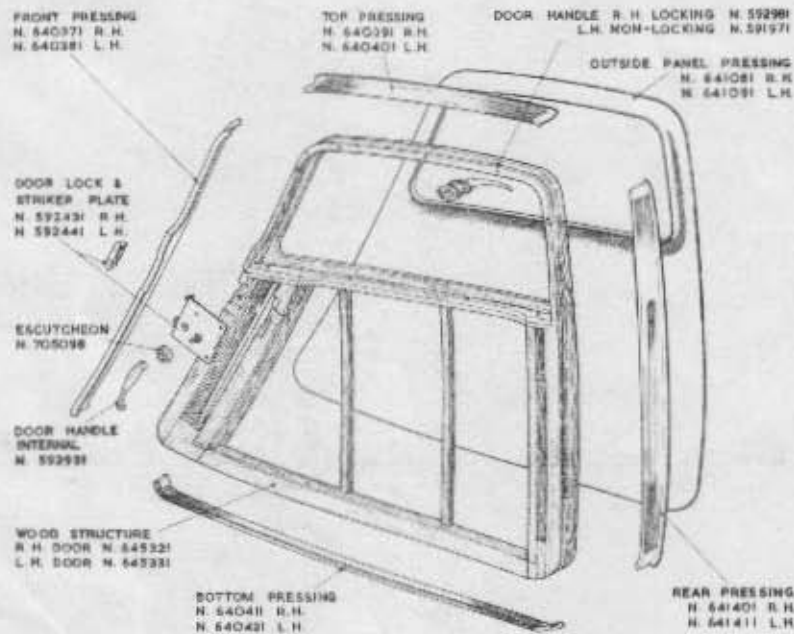


Fig. 12. Door Details.

4. Remove the fourteen wood-screws which secure the windscreen in the aperture frame, then withdraw the screen assembly forwards.

To refit the windscreen, reverse the foregoing procedure, noting that the external rubber sealing strip should be renewed if it is cracked or perished.

Replacing windscreen glass

To remove the unserviceable glass, first remove the windscreen as described previously, then dismantle the assembly in the following manner.

1. Withdraw the rubber sealing strip from the rim of the screen frame by extracting the staple at the joint and easing the rubber away from the frame.

Note :- The staple is usually situated behind a small patch located centrally at the bottom of the sealing strip.

2. Remove the holding screws and detach the three tie-plates from the frame and centre rail joints, then separate the halves of the screen frame and centre rail.
3. Lift out the unserviceable glass panel and detach and discard the rubber seal fitted around the rim.

Prepare and fit the replacement glass as follows :-

1. Fit a replacement strip of flat rubber over the edges of the glass, then locate the glass within the screen frame, closing the halves of the frame together and making sure that the rubber sealing strip seats evenly in its location. Carefully trim the rubber strip, cutting away all the surplus protruding rubber.
2. Refit the frame and centre rail tie-plates, and tighten the holding screws.
3. Fit the external sealing strip to the rim of the windscreen frame, making sure that the strip is not distorted at any point and arranging the joint at the bottom of the frame. Refit the staple, then fit a small rubber patch over the joint, using "Bostik C" adhesive.

surround.

Three plywood interior trimming panels are fitted to each door, the large panel incorporating a map pocket, and a telescopic ashtray. The panels are retained in position by concealed spring clips. Two types of panel trim styles have been produced, in the first of which all three panels are leather-covered, while in the second the narrow front and rear panels are cloth-covered and the map pocket and backing of the centre panel are leather-covered with a cloth

engaging a slotted locking strip mounted on the centre rail of the door. aperture being regulated by a spring-loaded catch lever mounted in the panel and front panel which is housed in top and bottom felt channel-pieces, the window Each door is fitted with a fixed window panel and a rearward-sliding

passenger's side is locked by the internal handle. on the driver's side is locked externally by a key, while the door on the hinged at the rear, and incorporates a single-acting lock mechanism. The door ing with drain tubes extending from the centre rail of each door. Each door is pieces are drilled at two locations for drainage purposes, the holes communicat- light-alloy outer panel is finally fitted and clinched into position. The bottom rear, top and bottom pressings welded together to suit the door aperture. A Each door consists of an ash and spruce frame encased in steel front,

Description

DOORS

4. Refit the windscreen assembly to the car as described previously.

1. Open the door and release the check strap from its attachment by unscrewing the retaining pin.
2. Support the door and remove the six screws securing each of the two hinge plates to the hinge pillar.
3. Lift away the door, taking care not to lose any packing pieces fitted behind the hinge plates. Mark any such packing pieces to ensure correct re-assembly.

Remove the door in the following manner :-

Removing and refitting doors

buffer units. Replacement of these items is covered on pages 28 and 31.

Renewal of the hinges, together with the door lock and striker plate unit and the lifting and lowering the "toe" of the door; any appreciable movement necessitates retaining screws. If this point is satisfactory, check the hinges for wear by has dropped on its hinges, first check the security and tightness of the hinge the lock striker plate for wear. If wear is apparent, indicating that the door buffers are worn badly on the base edges, examine also the lower guide flange of the rubber buffers are perished or cracked, fit replacements. If however the buffer units fitted towards the top and bottom of each door front pillar. If a few drops of engine oil. Periodically, examine the condition of the two door efficiency of the locking mechanism and lubricate the hinges occasionally with The doors require very little attention. Check periodically the

Maintenance

pillars. The check strap is covered with matching interior trim material.

panel, the four securing screws passing through the panel into the wooden hinge A check strap attachment is located at the bottom of each rear trimming

To refit the door :-

1. Offer the door to the hinge pillar, aligning the hinge plates with their recesses in the pillar, and interposing any packing pieces.
2. Fit and tighten securely the wood-screws and set-screws securing the hinge plates to the hinge pillar, then close the door and check the operation of the locking mechanism.
3. Refit the check strap to its attachment on the door.

Replacing doors

Doors are not interchangeable, since each is made to suit its particular body. Should damage occur necessitating a replacement door, a wood structure, together with separate pressings can be supplied. It will then be necessary to build the door to suit the particular door aperture.

Replacing door windows

In the following paragraphs it is assumed that both glass panels are to be replaced. Proceed as follows :-

1. Open the door and remove the three "Parker-Kalon" screws securing the sliding window locking strip to the centre rail; detach the strip.
2. Remove the two raised-head screws securing the window finisher in position and ease out the finisher.
3. Lift out the fixed glass panel and detach and discard the rubber sealing strip.
4. Move the sliding glass panel to the fully-open position and ease the felt channel-section out of the window frame mid-way along its bottom run to provide access to the frame securing screw. Remove the screw, re-position the felt and slide the panel to the half-open position. Withdraw the felt at points mid-way along their side runs and remove the two remaining frame securing screws; lift out the frame complete with sliding glass panel.

5. Spring the frame apart slightly at its joint, lift one edge of the window out of the felt channel-section and withdraw the panel.
6. While the window frame is removed, take the opportunity to examine the condition of the rubber beading fitted around the window aperture. If the rubber is cracked, perished or distorted it should be renewed; details of this operation are given on page 28. It is also recommended to renew the felt channel-section in the window frame when replacing the sliding window.
7. Remove the two 2 B.A. countersunk-head screws securing the lock assembly to the sliding window and separate the front and back plates, taking care not to lose the small spring and ball housed in the front plates.
8. Check the condition of the spring and ball; if they are rusted badly, replacements should be obtained.

Next, prepare and fit the replacement glass panels in the following manner :-

1. Apply a smear of grease to the ball and spring of the sliding window lock, and insert the ball, followed by the spring, into the front plate.
2. Locate the front plate in position on the replacement panel, fit the back plate and secure the assembly with the two 2 B.A. screws.
3. Fit a replacement felt channel-section into the window frame, locate the upper edge of the sliding glass panel into the channel, then spring the window frame apart slightly and insert the lower edge of the panel into position.
4. Locate the sliding window and frame assembly in position, then position the window and ease the felt out of the frame at the locations indicated in item 4 previously and fit the frame securing screws.
5. Push the felt channel-section back into the window frame and check that the window slides easily along its entire length of travel when normal finger pressure is applied to the lever.
6. Fit a new rubber sealing strip to the rim of the replacement fixed glass panel, then locate the panel in position and re-fit the finisher, securing it with the two raised-head screws.

7. Refit the sliding window locking strip and secure with the three "Parker-Kalon" screws.

Replacing window aperture rubber beading

To renew this, first remove the fixed window and the window frame and sliding panel. as described in the foregoing paragraphs, then extract the tacks and pull away the unserviceable beading.

Remove all portions of the beading still adhering around the window aperture with a knife, clean the area thoroughly, then apply an even coating of "Bostik C" adhesive to the attachment strip of the replacement beading. Press the beading firmly into position, arranging it around the aperture frame. Refit the window frame, sliding and fixed glass panels.

Replacing lock and striker plate assemblies

A replacement lock and striker plate is supplied as a single unit.

Note also that the type of external handle incorporating a circular escutcheon which is normally fitted to the car cannot be supplied as a spare. External handles of replacement lock assemblies are supplied with a flanged escutcheon integral with the handle; the assembly is secured to the door with two screws.

Remove the defective unit in the following manner :-

1. Open the door, then remove the four screws securing the striker plate to the front door post and detach the plate, together with any packing pieces that may be fitted behind it.
2. Detach the lock handle from the inside face of the door by depressing the spring-loaded rose into the escutcheon to

- expose the handle locking pin, then pressing out the pin, see Fig.13. Pull off the handle and detach the rose and escutcheon.
3. Remove the mushroom-head set-screw and plain washer located towards the front edge of the lock back plate, then pull away the external handle complete with spindle. Remove the screw from within the external escutcheon, then carefully prise the escutcheon from the door and discard it.
 4. Lever the bottom edge of the front trimming panel away from the door to disengage the spring clip, then continue around the entire edge of the panel as shown in Fig.14 until all clips are released. Swing the panel upwards away from the lock; the panel cannot be detached since the trimming fabric is held between the window finisher and the door frame.
 5. Extract the pins securing the "Rexine" beading on each side of the lock recess for approximately 6in. above and below the lock and pull away the beading to provide withdrawal clearance.
 6. Remove the four screws securing the lock side plate to the front face of the door frame, and the two screws from the inside face of the lock, then withdraw and discard the unit.

Fit the replacement unit as follows :-

1. Locate the lock in position and secure with the six screws.
2. Re-position the "Rexine" beading and secure with the pins.
3. Open out the spindle hole in the door frame front member to accommodate the increased diameter barrel of the replacement handle, then insert the replacement handle and secure its spindle on the inside face of the lock with the plain washer and set-screw.
4. Mark and drill the two escutcheon securing screw holes and secure the escutcheon with two dome-head, chromium-plated wood-screws.
5. Check the tightness of the spindle securing set-screw, and re-tighten if necessary.
6. Examine the trimming panel spring clips for condition. If they are rusted or broken, fit replacements as described on page 30. If all the clips are satisfactory, smear them

with grease, locate the panel in position and press firmly around the edges to engage the clips.

7. Fit the escutcheon and spring-loaded 'rose over the spindle protruding on the inside face of the lock, then fit the internal handle, insert the locking pin fully into the handle and spindle and release the spring-loaded rose.
8. Check the lock for freedom of operation.
9. Secure the replacement striker plate to the front door post with the four screws; do not interpose any packing washers at this stage.
10. Close and open the door a few times, checking the efficiency and security of the lock and noting the engagement of the lock dovetail with the striker plate.
11. If the lock is insecure due to insufficient engagement of the bolt with the striker plate, remove and refit the plate, interposing any packing pieces removed with the discarded striker plate. If, however, no packing was fitted to the original plate, use the replacement plate as a template and cut and drill a packing piece from aluminium sheet of suitable gauge.
12. Re-check the operation of the door lock.

Replacing trim panel fixing clips

Any clips which are rusted badly should be renewed in addition to any which may be broken.

1. To remove a clip, pinch it together and lift upwards to disengage the short leg from the holder; lift out the clip and discard it.
2. Smear the replacement clip with grease, pinch it together, and insert the long leg fully into the holder; this will permit the short leg to be inserted. Release the clip.
3. Remove all serviceable clips from the trim panel as detailed in item 1, grease and re-assembly them to their holders before refitting the trim panel to the door.

Replacing door buffers

It should be noted that where the rubber door buffers are worn badly on the bottom face, indicating that the door has dropped on the hinges, the fitting of replacement buffer units will not in itself effect a cure. Reference should therefore be made to page 32, where the procedure for rectifying a dropped door is described.

To renew a buffer unit which has perished or cracked, proceed as follows:-

1. Open the door, remove the two "Parker-Kalon" screws and the retaining plate from the rubber buffer, then detach the buffer and backplate.
2. Remove the two countersunk-head screws securing the buffer plate and remove the plate from its recess in the front door post.
3. Fit the replacement components in position, securing them with their appropriate screws.
4. Close and open the door to check the lock operation and the efficiency of the buffer units.

Replacing door hinge

To fit a replacement hinge, proceed as follows :-

1. Remove the door as described on page 25, and transfer the assembly to a bench.
2. Remove the two set-screws securing each end of the long hinge plate to the rear frame member of the door, followed by the seven wood-screws fitted between the two hinges; detach the hinge.
3. Plug the seven screw holes in the rear frame member, and the eight screw holes in the hinge pillar; do not plug the set-screw holes.
4. Locate the long hinge plate of the replacement hinge in the recess of the rear frame member and secure with the four set-screws.

5. Re-drill the seven holes for the wood-screws, then fit and tighten the screws.
6. Offer the door to the hinge pillar, locating the two hinge plates within the recesses in the pillar.
7. Support the door in this position and fit the four set-screws.
8. Re-drill the wood-screw holes, then fit and tighten the screws.
9. Close and open the door a few times to check the locking mechanism for security and the buffer units and dovetail for correct engagement; if satisfactory, refit the door check strap.
10. Should the lock prove insecure, due to insufficient engagement of the bolt with the striker plate, remove the door and, using the small hinge plates as templates, cut and drill packing washers from aluminium sheet of suitable gauge and refit the door, interposing the packing pieces between the hinge plates.
11. Re-check the security of the lock and check especially that the door has not been moved forward to such an extent that the front face of the lock fouls the striker plate.
12. When the door has been hung satisfactorily, re-connect the check strap.

Correcting a dropped door

Where a door has dropped on its hinges it will usually be found that the lock, striker plate and buffer units are worn badly or broken; these components should be renewed as described in the foregoing paragraphs. In addition adopt the following procedure.

1. Check the security of the hinge securing screws; if they are loose, tighten them and check whether the door has now returned to its correct position. If not, or if the screws are secure, lift and lower the "toe" of the door to check the hinges for wear.
2. If the door can be moved vertically on its hinges an appreciable amount, fit a replacement hinge, see page 31.

3. If the condition of the hinges is satisfactory however, remove the door as described in page 25 and, if a packing piece is interposed between the lower hinge plate and the hinge pillar, use this as a template for cutting similar packing pieces from sheet aluminium of suitable gauge. If no packing piece is already fitted, use the hinge plate as a template.
4. Refit the door, interposing the extra packing piece at the lower hinge location, then check that the door has been returned to its correct position and that it closes satisfactorily.
5. If the front face of the lock now fouls the striker plate as the door is closed, check whether or not a packing piece is fitted at the upper hinge plate location. If a packing piece is fitted, remove the door, discard this packing piece or substitute one of thinner gauge and refit the door, regulating the number of packing pieces fitted at the lower hinge plate location.
6. Re-check the fit of the door; if still unsatisfactory, fit a replacement hinge as described on page 31.

QUARTER LIGHTS

Description

Each hinged quarter light consists of a 5/32 in. thick toughened plate glass panel mounted in a split chromium-plated frame which is hinged at its front end. A moulded rubber sealing strip is fitted around the periphery of the frame and makes a dust and waterproof seal when the quarter light is closed. Quarter light opening is effected by a toggle catch.

Replacing quarter light glass

To renew the glass, first remove and dismantle the quarter light in the following manner :-

1. Operate the toggle catch to open the quarter light, then remove the three screws securing the toggle bracket to the inside edge of the quarter light aperture.

2. Remove the five raised-head screws securing the finisher and detach the finisher; this will provide access to the hinge securing screws.
3. Support the quarter light, remove the four "Parker-Kalon" screws securing the hinge to the aperture frame and lift away the assembly.
4. Remove and discard the rubber sealing strip fitted to the periphery of the frame, then remove the countersunk screws securing the hinge to the frame.
5. Spring the frame apart at the joint sufficiently to disengage one edge of the glass from the frame, then remove the unserviceable panel.
6. Remove and discard all rubber glazing strip.

Prepare and fit the replacement glass as follows :-

1. Clean thoroughly the glazing strip location of the frame, then fit new glazing strip, securing it with "Bostik" adhesive.
2. Spring the frame apart slightly and insert the replacement glass, then draw the ends of the frame together and check that the glazing strip is not distorted or displaced at any point.
3. Re-assemble the hinge to the frame, securing it with the countersunk screws, then fit a length of replacement rubber sealing strip to the periphery of the frame, making sure that the ends of the strip fit snugly against the hinge.
4. Position the quarter light and secure the hinge to the aperture frame with the four "Parker-Kalon" screws, then refit and secure the finisher.
5. Close the quarter light and secure the toggle bracket in position with the three screws.

REAR WINDOW

Description

Two types of rear window have been produced. The first type comprises a fixed glass panel retained in position by a moulded rubber seal and finisher,

glazing compound forming a seal between the rim of the glass and the body skin. Provision for opening the window is incorporated in the second type, a hinged frame carrying a "Perspex" panel being controlled by a winder of the interlocking link type. Where this type of window is installed, moulded rubber sealing strip is fitted around the window aperture and to the rear of the frame.

Replacing rear window glass (1st type)

To replace a damaged rear window glass of this type, proceed as follows :-

1. Remove the six screws securing the finisher and detach the finisher, followed by the moulded rubber sealing strip; check the condition of the strip and, if necessary, obtain a replacement.
2. If necessary, extract the tacks and pull away the head lining to provide access to the six glass retaining brackets, then remove the "Parker-Kalon" screws and detach the brackets.
3. Remove the damaged glass, and clean all trace of glazing compound from the window aperture.
4. Apply "Dum-Dum" or similar sealing compound freely around the window aperture, and locate the replacement glass in position. Fit the six glass retaining brackets and secure with the "Parker-Kalon" screws.
5. Re-position and secure the head lining around the aperture frame if removed previously.
6. Refit the rubber sealing strip and finisher.
7. Trim away neatly all excess sealing compound from around the rear window aperture, checking that an efficient seal has been made between the rim of the glass and the body skin.

Replacing "Perspex" panel (2nd type)

Replace a damaged panel in the following manner :-

1. Wind the window open slightly and remove the set-screw securing the link to the small attachment bracket on the window frame.

2. Remove the two screws and detach the hinge covers, then support the assembly and remove the hinge pins; lift away the window.
3. Detach the rubber sealing strip from the rear of the frame, then separate the halves of the frame and lift out the damaged "Perspex" panel.
4. Remove and discard the rubber glazing strip from the panel, or remove all trace of "Bostik" compound from the frame, according to the type of glazing seal employed.

Now prepare and fit the replacement "Perspex" panel in the following manner :-

1. (a) Assemble a rubber glazing strip to the rear of the panel, then fit and close the halves of the frame around the panel.

or

 (b) Apply "Bostik" glazing compound liberally to the frame channel and assemble the halves of the frame to the "Perspex" panel. Clamp the frame in position until the glazing compound has set, then remove the clamps and trim away excess glazing compound from the frame, taking care not to scratch the "Perspex".
2. Fit the moulded rubber sealing strip to the rim of the frame, making sure that it is not distorted.
3. Offer the window assembly to the aperture, engaging the hinges between the hinge plates, then apply a smear of grease to the hinge pins and fit them securely in position.
4. Refit the hinge covers.
5. Connect the extending link to the attachment bracket on the frame with the cheese-head set-screw, then wind the window to the closed position.

SEATS AND UPHOLSTERY

Description

A bench type rear seat is fitted, while separate front seats are provided for the driver and passenger. All seats are quickly detachable.

The two front seats are similar in construction, each comprising a hardwood seat frame, mounting a coiled wire spring unit and foamed latex cushion pads. The seat is upholstered with biscuit-coloured upholstery leather and cinnamon-coloured carpet cloth. The back-rest is adjustable for rake, the frame being of tubular steel with an inner framework of hardwood. Two wooden side wings are secured to the tubular frame and are padded with rubberised hair. The lower ends of the tubular frame are drilled and bolted to the pivots mounted on the seat frame. Rake adjustment is effected by a dome-head adjusting bolt and lock-nut locating in threaded lugs in each side tube, the bolt heads bedding on a locating strip secured at the rear of the seat base. A rake adjuster is shown in Fig.15.

Each front seat is mounted in channel-section runners, and fore-and-aft adjustment is provided by spring catches which engage a notched seat guide secured to the inboard runners.

Two types of rear seat may be encountered: the early type with two separate seat cushions, or the later type with a full-width seat. Irrespective of type, rear seat construction is similar, comprising a plywood base mounting a coiled wire spring unit with wadding cushion pads, the upholstery being similar to the front seats. A separate plywood-backed seat squab is fitted and is also quickly detachable. Detachable arm-rests are secured to the rear side trimming panels, each arm-rest embodying a telescopic ashtray.

Six Wilton carpet panels are fitted, i.e. left and right-hand front carpets, centre front carpet, two centre carpets and the rear carpet. The front carpets are cut to fit around the dip switch, clutch and brake pedals, and the oil and water temperature capillaries according to the drive side of the car, the left and right-hand carpets being joined to the centre front carpet by "Rexine"



Fig.13. Removing Door Lock Handle.

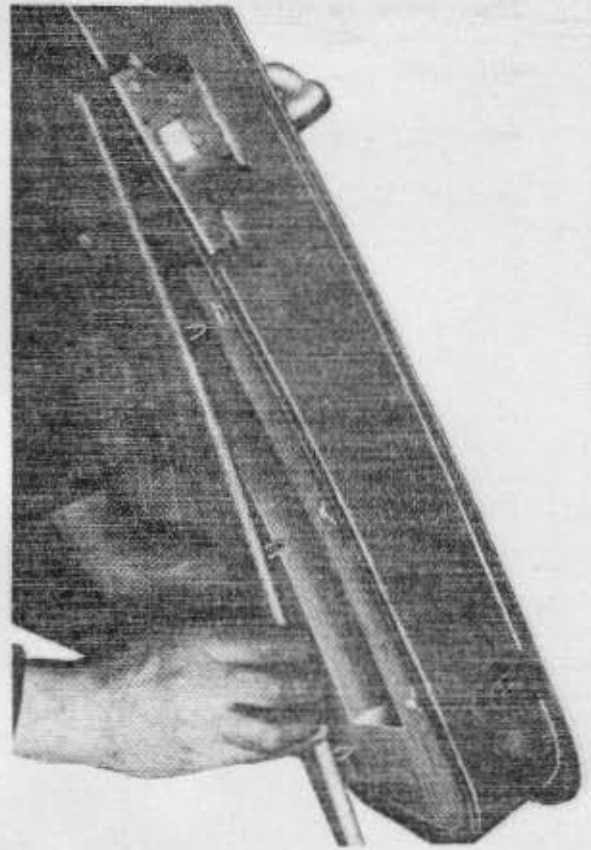


Fig.14. Removing Door Trim Panel.

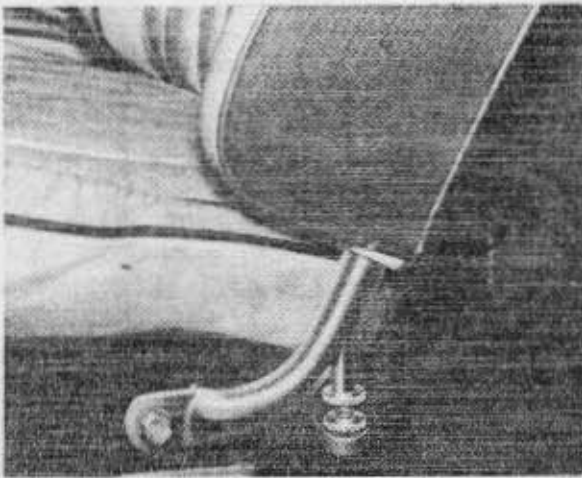


Fig.15. Backrest Adjustment.

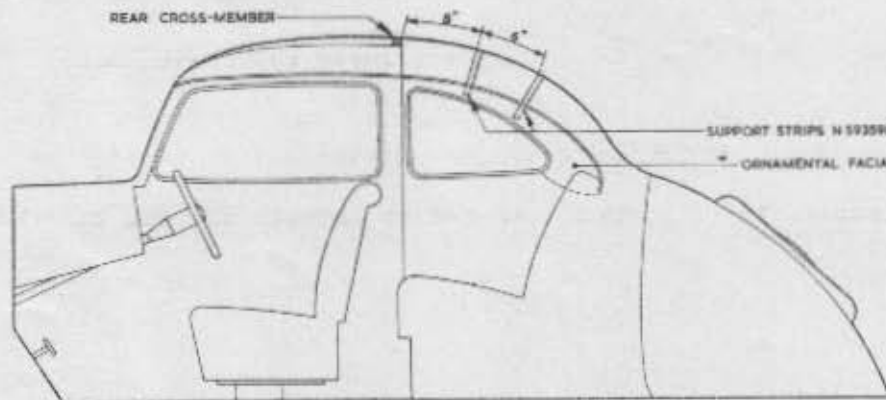


Fig.16. Location of Head Lining Support Strips.

hinges. The front and rear carpets are quickly removable, being retained in position by concealed spring clips; the two centre carpets are secured to the chassis cross-member with "Bostik" adhesive.

The left and right-hand scuttle panels incorporate louvred ventilator panels; an air inlet control lever in the top of the panel being linked to spring-loaded flaps in the external scuttle panels.

The wool-cloth head lining is secured to a felt roof lining with "Bostik" adhesive, the roof lining being secured to the roof panels with "Bostik". Tacks secure the head lining around the rear window, quarter light and windscreen aperture frames, the tacks being concealed by detachable hardwood window finishers.

Removing and refitting front seats

To remove a front seat, fold the back-rest forward, pull up the seat locking catch to disengage it from the adjusting catch, slide the seat rearwards out of the runners and lift it from the car.

To refit the seat, fold the back-rest forward, engage the seat with the runners and slide the seat forward until the locking catch engages the lobe of the adjusting catch.

Removing and refitting rear seat(s)

To remove the rear seat(s), first hold forward the back-rests of the front seats, then lift up the rear seat(s) at the front and pull forward and lift them clear of the car. Lift up the squab to disengage its two anchorages from the brackets on the squab shelf, and withdraw it from the car.

To refit the rear seat(s) and squab, reverse the foregoing procedure.

Removing and refitting floorboards and tunnels

The following paragraph describes the operations necessary to provide access to the gearbox and propeller shaft from within the car.

1. Remove the front seats in the manner described on page 39.
2. Detach and remove the front and rear carpets.
3. By removing the appropriate mushroom-head securing screws, detach and remove the undermentioned components in the following order :-
 - (a) Clutch inspection cover.
 - (b) Front tunnel.
 - (c) Rear tunnel.
 - (d) Left and right-hand floorboards.
4. If it is required to remove the toeboards, first disconnect the accelerator pedal, detach the clutch and brake pads from their levers and detach the dip switch, before removing the toeboard securing bolts.

Reverse the foregoing sequence to refit the floorboards and tunnels.

Replacing head lining

To fit a replacement head lining, 4 yards of wool-cloth, 54in. wide will be required. This quantity of material is sufficient to replace all portions of the car interior covered with wool-cloth, including the sun visors.

The method of fitting the replacement cloth forward of the roof rear cross-member, to the rear door pillar trim panels and to the squab shelf and

ornamental facias above the quarter lights, follows normal trimming practice, and is not covered in this Manual. A special technique is, however, employed when fitting the head lining to that portion of the roof rearwards of the rear cross-member, and is described herewith.

1. Remove the quarter light finishers, the rear window finisher and (if fitted) the window winding mechanism.
2. Detach the ornamental facias fitted above the quarter lights, removing at the same time the two roof lining support strips, if fitted.
3. Remove the unserviceable head lining, easing it away carefully at locations where it remains adhering to the felt underlining.
4. Check that the felt underlining is adhering to the roof panel over its entire area and, if this point is satisfactory, proceed as follows.
5. Clean all trace of the original adhesive from the surface of the felt with trichlorethylene or petrol.
6. Cut the replacement head lining to size, using the old lining as a pattern wherever possible.
7. Spray or brush the surfaces of the felt underlining and the new head lining with "Bostik 1774 or 1775" adhesive and allow both surfaces to dry until the whiteness has disappeared from the adhesive film.
8. Offer up and press the new lining into position, securing it around the rear window and quarter light apertures with tacks where this method of securing was used originally, and making sure that the cloth adheres to the felt over its entire area.
9. Refit the rear window finisher and the window winder if removed previously.
10. Assuming that two head lining support strips were installed originally in the car, re-cover the strips with new head lining material and re-trim the ornamental facias and the rear door pillar panels in a similar manner.
11. Locate the two support strips against the head lining as shown in Fig.16, and secure by refitting the ornamental facias.
12. If, however, the support strips are not fitted to the car, it is recommended that they are obtained from the Car Division of

the Bristol Aeroplane Company Limited, and fitted. The part number of the strips is N.593591, and they can be supplied with or without covering as required. When fitting the strips, first bend them to the required shape, trim off the ends to practically coincide with the lower edge of the ornamental facias, then fit and secure the strips as described in item 11.

13. Refit the rear door pillar trim panels and the quarter light finishers.

HEATER AND DE-MIST SYSTEM

Description

A "Clayton" type heater is an optional fitting on the type 400 car.

The heater is mounted on a bracket which is riveted to the inside face of the battery tray and comprises a circular radiator core and an electric fan contained in a housing on top of the heater unit. Where the standard cooling system is installed, i.e. thermostatically-controlled radiator shutters, hot water is conveyed to the heater intake by a copper pipe coupled to a connection in the radiator top hose, the water being ducted back into the cooling system, after circulation through the heater, by a second copper pipe connected to the radiator bottom hose (feed to water pump). However, where a water pump embodying a thermostatically-operated outlet valve is fitted to the engine, the hot water supply to the heater is taken from a banjo connection on the right-hand rear side of the cylinder head.

Two doors are provided in the base of the heater for the emission of warm air for heating the car interior, while two further outlets at the top of the unit supply warm air through flexible rubber pipes to two de-mister ducts fitted immediately below the windscreen.

Two heater controls are fitted and are located at the two bottom corners of the battery tray. The right-hand control is linked to an "ON-OFF" tap in the water supply pipe to the heater, and the left-hand control is a rheostat which governs the speed of the heater fan.

A general view of the heater and controls as installed in the car is shown in Fig.17.

Installing "Clayton" heater

Complete heater installation sets are obtainable from the Car Division of the Bristol Aeroplane Company Limited. If a thermostat-type water pump has been fitted, this should be stated, as a different water circuit is required which employs the rear of the cylinder head instead of the top radiator hose.

To install the heater, proceed as follows :-

1. Drain the cooling system (see Section 2) and remove and discard the radiator top and bottom hoses, if radiator shutters are installed.
2. Remove the battery.
3. Remove the starter.
4. Referring to Fig.18, mark off the location of the nine heater mounting bracket rivet holes in the battery tray, drill the holes $\frac{1}{8}$ in. diameter, then draw-sink the holes at 90° with a No. 4 drill; rivet the mounting bracket to the underside of the battery tray.
5. Referring to Fig.19, mark off the location of the four holes in the rear face of the battery tray and the two 1 in. diameter holes in the right-hand side of the scuttle.
6. Drill the four holes in the rear of the battery tray with a No. 30 drill, then cut the two 1 in. holes in the scuttle.
7. Fit the rubber grommets to the two holes.

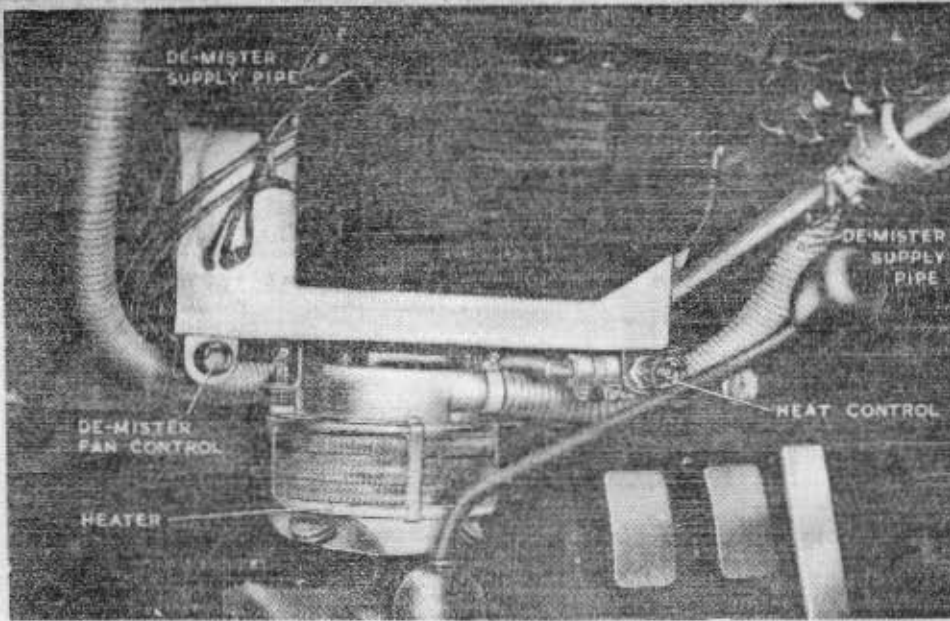


Fig.17. "Clayton" Heater and Controls.

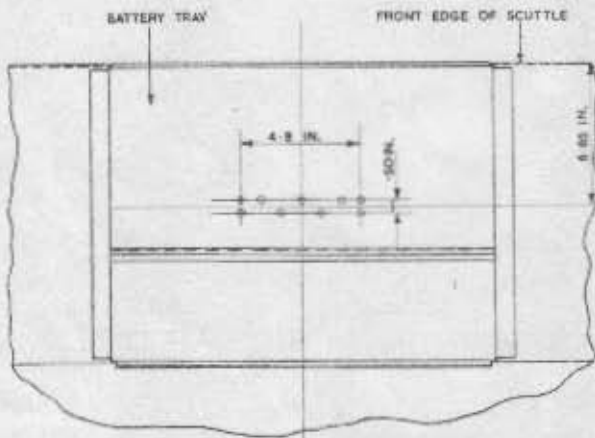


Fig.18. Modification to Battery Tray.

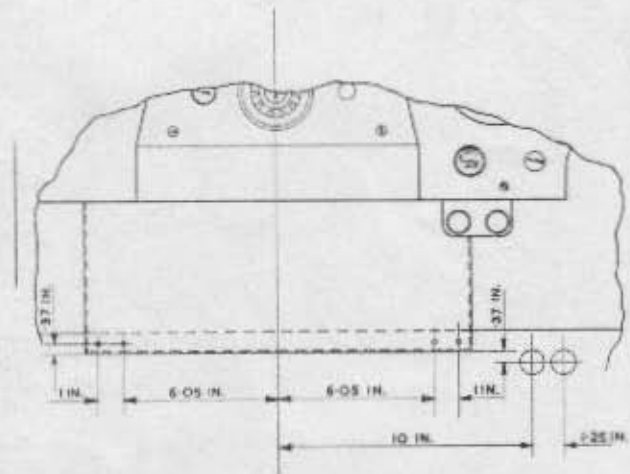


Fig.19. Modification to Battery Tray and Scuttle.

8. Offer the heater to its mounting bracket, then mark and trim off excess length from the two heater stub pipes to provide sufficient clearance between the heater and battery tray for the feed and return water pipes.
9. Couple the pipe N.631671 to the left-hand heater stub pipe, and the pipe N.631631 to the right-hand stub pipe with rubber hose connectors and Jubilee clips. Secure the heater loosely to its mounting bracket, locating the front end of pipe N.631671 in the inboard grommet on the right-hand side of the scuttle.
10. Connect the heat control tap to pipe N.631631 with a rubber hose connector and Jubilee clips, then insert the front end of pipe N.631711 in the outboard rubber grommet and connect its rear end to the tap with a hose connector and Jubilee clips.
11. If radiator shutters and the standard type of water pump are installed, assemble the pipe connectors to the new radiator hoses in the following manner; the method of assembly is identical for both top and bottom hoses. Apply "Bostik B" adhesive to the flange of the connector, insert the connector into the hose and locate it in the hole cut in the wall of the hose, making sure that the curved flange seats squarely against the wall. Apply "Bostik B" to the concave face of the special washer and to the area around the hole in the hose wall, then fit the washer over the protruding connector. Make sure that the washer seats squarely against the hose, then screw on and tighten the nut. Assemble the two hoses between the radiator and water pump.
12. Where a standard water pump is fitted, assemble the two remaining copper pipes between the connectors in the radiator hoses and the two pipes protruding through the scuttle, and connect them with the rubber hose connectors and Jubilee clips. Secure the halves of the support clip around the two pipes at a position midway between the two exhaust manifolds with the bolt, washer and nut.
13. Refit the starter, then tighten the two heater retaining nuts.
14. Remove the outer lock-nut from the heater control tap, fit the mounting bracket to the tap and secure with the lock-nut.
15. Align the two holes in the bracket with the corresponding holes in the lower right-hand corner of the battery tray, then secure the bracket to the tray with two countersunk-head rivets.
16. Turn the spindle of the tap clockwise as far as possible, (i.e. "OFF" position), then fit the small sleeve over the spindle, followed by the heat control knob, arranging the knob so that the word "HEAT" is horizontal.

17. Drill through both the shank of the knob and the sleeve into the spindle with a No. 44 drill (0.086in. dia.), tap 6 B.A., then fit the grub-screw.
18. Assemble the fan rheostat to its mounting bracket, and rivet the bracket to the lower left-hand side of the battery tray. Fit the knob to the rheostat spindle and secure with the grub-screw.
19. Connect one lead from the heater to one of the rheostat terminals with a "Hellerman" sleeve and "Ross-Courtney" terminal; earth the remaining rheostat terminal to the scuttle.
20. Pass the remaining heater lead through the aperture in the scuttle which carries the main electrical loom. Cut the lead at the front of the scuttle and assemble the cable end, followed by the connector tube, to the end of the lead. Assemble the remaining cable end to one end of the severed length of lead, connect to the connector tube, then couple the other end of the lead to terminal "A4" in the junction box.
21. Refit the battery.
22. Slacken the Jubilee clip and partially withdraw the hot water supply pipe to the heater from the rubber hose connector at the front of the scuttle. Turn "ON" the heat control knob. Refill the cooling system carefully, allowing all air to bleed from the loosened connection. When water issues from the connection, refit the pipe, tighten the Jubilee clip and fill the radiator to the correct level.
23. Remove the windscreen bottom finisher, the left and right-hand rear finishers of the screen rail and the left and right-hand fascia panels.
24. Connect the flexible pipes to the two de-mister ducts and secure with the hose clips.
25. Detach the trimming from the rear finisher locations, then refit the windscreen bottom finisher temporarily to assist in the correct positioning of the ducts.
26. Offer the two ducts to the windscreen rail, aligning them with the two slots cut in the bottom finisher, then secure the ducts to the rail with the eight wood-screws; detach the bottom finisher.

Note :- If necessary, recess the windscreen wiper mechanism deeper into the windscreen rail to permit correct fitting of the ducts.

27. Connect the two flexible pipes to the warm air outlet stub pipes of the heater, securing them with the hose clips.
28. Re-position the trimming removed previously, then refit all finishers and the left and right-hand fascia panels.
29. Open the two small doors at the base of the heater, then take the car on the road and check the heater and its controls for correct functioning.

BOOT

Description

Two types of boot have been produced for the type 400 car. The first type incorporates a door hinged at its upper end, with the spare wheel accommodated vertically within the boot immediately to the rear of the squab bulkhead. A single stay is fitted to the left-hand side of the boot door and comprises an upper and lower lever pivoted together and incorporating a friction disc type damper. When opened, the door may be retained in any desired position by tightening the damper hand nut. The capacity of the second and later type of boot is increased by lowering the boot floor and by mounting the spare wheel on the outside of the boot door, where it is enclosed by a light-alloy cover secured by an embellisher cap with a medallion similar to the wheel caps.

A single locking handle incorporating a tumbler type lock is fitted to both types of boot door.

Removing spare wheel

(2nd. type boot door)

To remove the spare wheel, proceed as follows :-

1. Open the boot door and remove the wing nut from the cover securing bolt on the inside of the door; detach the cover.

2. Remove the nuts securing the spare wheel to the studs in the wheel mounting block, then lift off the wheel.

Removing and refitting boot door

When removing the boot door to effect repairs to the body, adopt the following procedure :-

1st. type door

1. Open the door to its full extent, support it in this position and remove the three screws securing the door stay to the left-hand side-member of the boot aperture frame.
2. Remove the three wood-screws securing each door hinge to the boot sill member and lift away the door.

2nd. type door

1. Open the door to its full extent, support it in this position and remove the two wood-screws and metal plate securing each door strap to the boot framework.
2. Remove the wood-screws securing the two door hinges to the lower boot frame member, and lift away the door.

Reverse the foregoing sequences when refitting the boot door.

Replacing boot door lock

It is recommended that no attempt is made to rectify a faulty tumbler mechanism of the boot door lock; a replacement lock unit should be obtained and fitted. The method of fitting a new lock is identical for both types of boot door.

1. Open the boot door and, if the door is of the first type (see Description) remove the raised-head screws and cups and detach the interior door panel.

2. Unscrew the handle retaining set-screw from the inside face of the lock and pull the handle, complete with tumbler mechanism, away from the door.
3. Remove the four screws from the inside face, and the two screws from the end plate of the lock and withdraw the faulty unit from the door.
4. Locate the replacement lock in position and secure with the six screws, then insert the handle and secure by fitting and tightening the set-screw on the inside face of the lock.
5. Refit the interior door panel if applicable, then, before closing the boot door, insert the key and check the tumbler mechanism for correct locking.

Replacing boot door buffer units

(2nd. type door)

The buffer units are identical to those fitted to the doors, and may be replaced according to the instructions given on page 31.

Replacing boot door

A replacement boot door cannot be supplied in its finished condition. Outer and inner pressings etc., can, however, be supplied and it will first be necessary to cut the apertures for the spare wheel tray in the two panels. The tray is then welded to the outer panel, and the fluted stiffener to the inner panel, then the replacement door built, the inner and outer panels trimmed and clinched together and the various wood members interposed to suit the boot aperture of the particular car.

Details of the boot door are illustrated in Fig.20, and it should be noted that the spare wheel tray apertures are shown already cut for reasons of clarity.

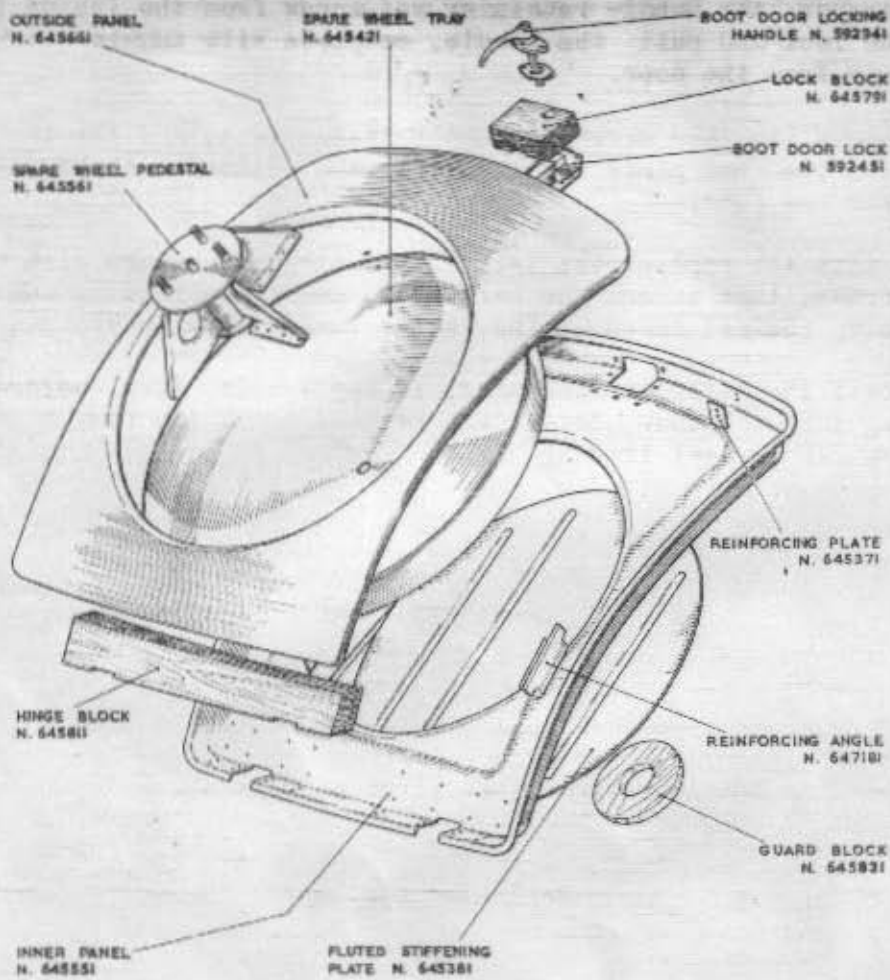


Fig.20. Boot Door Details.

400

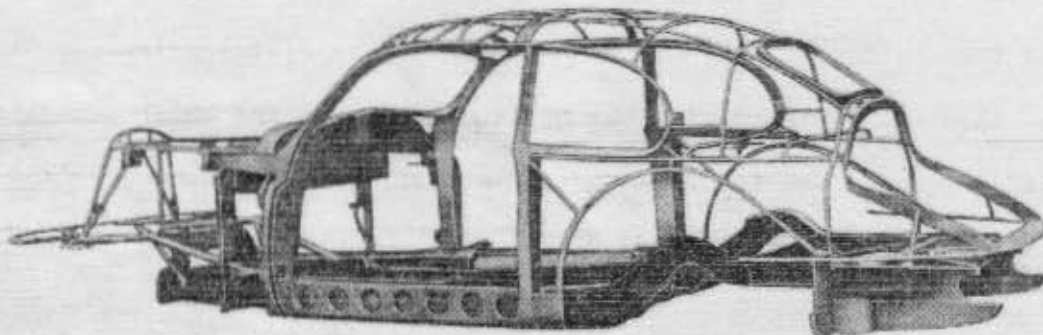


Fig.21. Body structure mounted on Chassis Frame.

401/3

TYPES 401 AND 402

BODY STRUCTURE

The body structure is mainly of steel tubular construction built up on the basic chassis frame, and covered with a light-alloy shell. The basic body structure is illustrated in Fig.21.

Pressed steel side extensions are mounted on outriggers welded to the chassis side-members, and the front and rear door pillars are welded in position on the outriggers. The pillars carry the door and quarter light cant rails, which are braced across the roof of the car by a welded tubular structure which extends rearwards from the quarter light cant rails, and to which is welded the boot door aperture frame and the rear window frame.

This tubular structure is itself braced by two tubular cross-members welded to the two main longitudinal tubes, the cross-members also serving as a support for the squab shelf. Additional tie tubes are welded to the rear door pillar, the two main longitudinal tubes and to the boot aperture frame, the tie tubes serving as attachments for the rear wheel arch frames and rear clinching angle.

At the front of the body structure, box-section steel supports are welded to the chassis side-members, the supports mounting the scuttle assembly, which incorporates the battery tray and two tool trays.

The steel windscreen aperture frame is welded to short support tubes on the rear of the scuttle, the top run of the frame being welded to the tubular roof members.

Two large diameter tubular structures are welded to the front ends of the chassis side-members and form the upper portions of outriggers to which the front bumper is bolted. The clinching angle for the front wings and bonnet shell is mounted on the front ends of the outriggers.

Tubular steel braces extend upwards from the outriggers and serve to support the bonnet frame, which is welded at its rear end to the scuttle. The four bonnet hinge boxes are welded to the frame.

The following additional components are assembled to the basic structure, and are shown in Fig.22. At the front of the structure, louvred side valances and ventilating duct diaphragms are riveted to the bonnet frame and the light-alloy scuttle side panels; these panels are spot-welded in position and incorporate rectangular air duct apertures. An armour-ply or "Tufnol" bulkhead is riveted to the front of the scuttle.

At the rear of the structure, the steel wheel arch panels are welded to the wheel arch frames and riveted to the chassis rear extensions. The boot floor frame rear sill member is welded in position between the rear clinching angle, and forms the rear contour of the car. The light-alloy boot floor and extension is secured to the chassis frame with "Parker-Kalon" screws, and to the sill member, floor frame and clinching angle with "pop" rivets.

All tubular roof members are bound with hessian before the welded panels of the body shell are fitted.

The body skin is of 18 S.W.G. aluminium alloy, except on the top surfaces of the wings, where it is of 16 S.W.G. for strengthening purposes. The skin is attached to the body by clinching round the front and rear clinching angles, the

front and rear door pillars, cant rails, windscreen frame, rear window frame and petrol filler box aperture. On early production cars, where a steel boot door frame is fitted, the skin is secured to the frame by clinching, but on later models, where an aluminium frame is embodied, 4 B.A. countersunk bolts, shake-proof washers and nuts are used. Round the bonnet aperture, the skin is attached to the frame by aluminium rivets.

The type 402 body structure is similar to the type 401, except that the roof structure is deleted and the windscreen sill, centre and side pillars are of sturdier construction to provide rigid support for the hood when erected. The windscreen side pillars are of steel-sheathed wood, butt-welded to the front door pillar, the wood extending into the door pillar where it is secured with wood-screws. A polished aluminium shell is secured over the steel sheathing by clinching and with wood-screws.

In addition, the boot framework is extended forward and minor alterations are made to the rear door pillars and rear wheel arch panels to provide stowage space for the hood when not in use.

BONNET

Description

The bonnet is a single light-alloy panel, reinforced by a riveted angle strip and welded tubular steel structure, as shown in Fig.24. The bonnet is retained in position by four positive-lock, combined hinge/locks (see Figs.25 and 26) which are bolted to brackets on the side diaphragm. The locks can be released only from within the car by pulling the spring-loaded toggle knob marked "B" situated under the facia panel and on whichever side of the car it is required to open the bonnet.

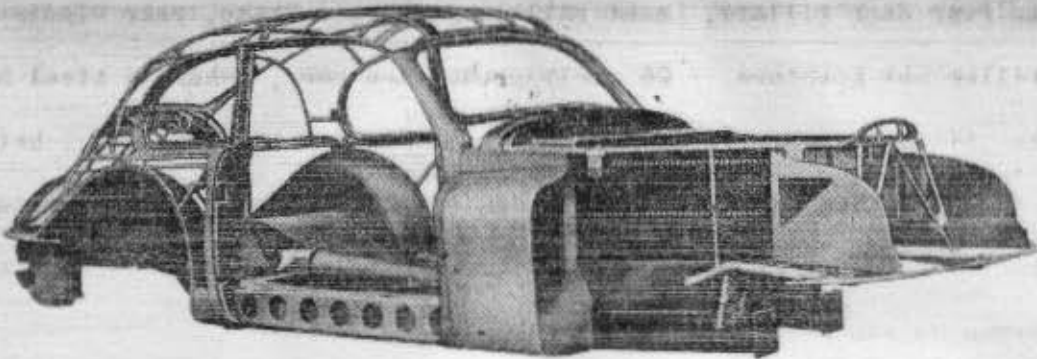


Fig. 22. Body structure before skinning.

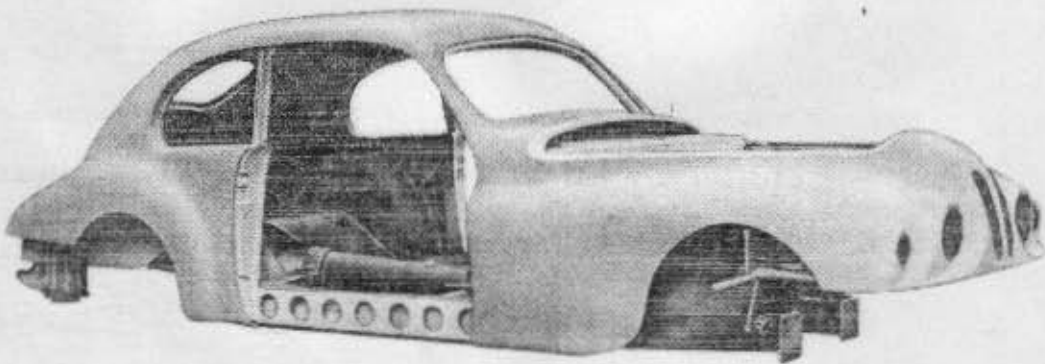


Fig. 23. Completed Body structure.

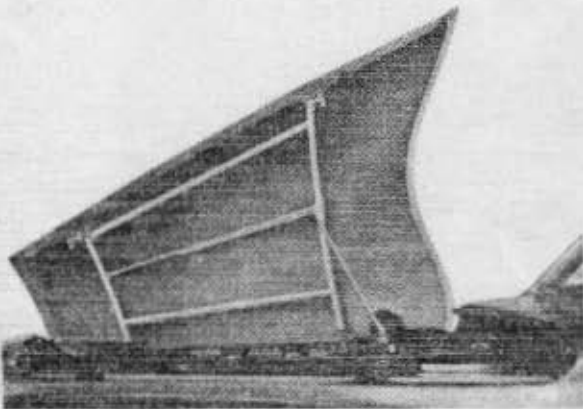


Fig. 24. Bonnet Details.

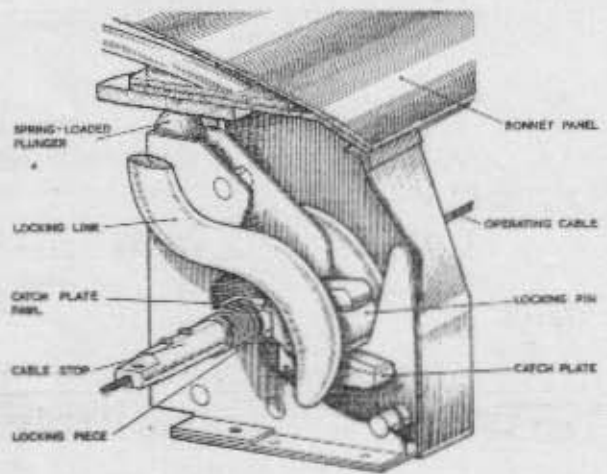


Fig. 25. Bonnet lock operation (Bonnet closed).

Fig.25 shows the bonnet in the closed position, with the locking pin of the bonnet locking link locked by the catch plate, the pawl of which is in engagement with the locking piece. The spring-loaded plunger is depressed into its housing by the bonnet. Referring to Fig.26, operation of the toggle draws the cable stop rearwards, thus pressing the locking piece out of engagement with the catch plate which, under the influence of its tension spring, pivots about its fulcrum pin and releases the bonnet locking pin. This action releases the load on the spring-loaded plunger, which then raises the bonnet sufficiently to provide a hand-hold. The bonnet then hinges on the locking pins on the opposite side as it is opened.

When opened, the bonnet is retained in position by a spring-loaded stay, as shown in Fig.27. The stay is mounted at its lower end on a swivel bracket secured to the front of the bulkhead, and at its upper end by a quick-release pin and spring clip (first 125 cars) or a bolt, nut and washers (later cars) which engages with a slider rail welded between the two transverse tubes of the reinforcing structure. The rail is kinked at its rear end to form a locking notch for the stay when the bonnet is in the open position.

Maintenance

Periodically clean all dirt accumulation from the bonnet locks and stay, then lubricate the lock mechanism, the stay pivot and the rail on the underside of the bonnet with grease.

Adjusting lock release mechanism

After considerable service, it may be found that the locks do not release together when the toggle is operated. First check the position of the cable

stops in relation to the compression springs fitted forward of the locking pieces; the stops should just abut the springs. To adjust the position of the rear lock cable stops, release the two grub-screws in the stop and slide the stop along the cable until the thrust face of the stop is aligned with the front face of the lock housing; tighten the grub-screws. When adjusting the front lock cable stops, first make sure that the toggle knob under the facia panel is "fully home". Holding the stop firmly to prevent it being pulled forward by the return spring as the grub-screws are slackened, release the grub-screws, move the stop rearwards until it is aligned with the front face of the lock housing, then hold the stop in this position and tighten the grub-screws.

Close the bonnet, then check that the lock release mechanism functions satisfactorily.

Removing and refitting bonnet

To remove the bonnet, proceed as follows :-

1. Operate the toggle on one side of the facia panel.
2. Open the bonnet, disconnect the stay from the rail on the underside of the bonnet, then lower the panel carefully.
3. Operate the remaining toggle, then lift away the bonnet.

To refit the bonnet, proceed as follows :-

1. Lower the bonnet into position and press down one side to engage the catch pins with the locks.
2. Open the bonnet, reconnect the stay, then lower the bonnet and press down to engage the remaining locks.

1. Position the bonnet tubular structure in the bonnet aperture, checking that the locking links engage correctly with the four bonnet locks.
2. Offer the two side stiffening angles to the frame, make sure that they are aligned correctly relative to the bonnet aperture, then mark the four frame attachment locations on the two stiffeners.
3. Remove the frame and stiffeners and rivet the stiffeners to the frame.
4. Refit the frame in the bonnet aperture, then locate the replacement bonnet panel pressing on the frame and adjust its position to obtain a satisfactory seating. Drill through the sides of the panel into the side stiffening angles with a fine drill and secure the panel temporarily to the angles with suitable locating pins.

The sequence of operations when fitting a replacement panel is as follows :-

In the event of damage to this unit, every endeavour should be made to repair the tubular structure. Replacement bonnet panel pressings can be supplied, and these must be trimmed and fitted to suit the particular car. It should be noted that the profile of the bonnet was changed at Chassis No.696; therefore, when ordering a replacement panel, the chassis number of the car must be quoted.

Replacing bonnet

This defect will occur only after considerable service, and is indicated by an excessive gap between the bonnet edge and wing valances, weak response when the release toggle is operated and, possibly, by rattles when the car is on the road. The wear will normally occur between the bonnet catch pin and the lock catch plate, and this may be remedied by regulating the number of packing pieces fitted between the base of the lock and its mounting bracket, after removing the four securing bolts, washers and nuts.

Adjusting for wear in lock mechanism

5. Rough-trim the panel to the aperture contour, then remove the frame and panel unit.
6. Position the front and rear stiffeners on the underside of the panel, and spot-weld all stiffeners to the panel.
7. Weld the corner gussets into position at the junctions of the side and rear stiffening angles, then weld up the small locating holes which were drilled previously in the panel.
8. Fit the bonnet assembly to the car and finish-trim the panel to provide an all-round even clearance of 0.100in. in the bonnet aperture.
9. Remove the assembly, clean up the panel generally, then offer the chromium-plated flash to the panel, and mark and drill the securing stud holes.
10. Paint the bonnet to match the car, fit the flash, then assemble the bonnet to the car and connect up the stay unit to the underside of the panel.

RADIATOR GRILLE

Description

The grille comprises two separate built-up units, each unit comprising a cast aluminium-alloy strip grille component which is secured to the radiator shell, independent of a chromium-plated aluminium or brass frame, see Fig.28.

Removing and refitting

To remove the grille, first open the bonnet and, working through the space between the radiator and the bonnet shell, remove the two 4 B.A. nuts and clamping plates from the studs securing one grille section at the top and bottom of the bonnet shell aperture, and detach the grille. The remaining grille section can now be removed by working through the aperture provided.

If it is desired to increase the aperture, the grille frames may be removed by unscrewing the 4 B.A. nuts and shake-proof washers from the eight studs secur-

ing each frame to the rim of the shell aperture. To refit the frames and grilles, reverse the foregoing sequence.

BUMPERS

Description

Three types of sheet aluminium-alloy bumper have been produced.

The first type of bumper is chromium-plate and incorporates a moulded rubber strip, the rear bumper also housing the stop, tail and reverse lamps. This type of bumper, which is illustrated in Fig. 29, is fitted to all type 402 cars and to a proportion of the first 125 type 401 cars produced, the remaining type 401 cars being fitted with the second type of bumper, illustrated in Fig. 30, and described in the following paragraph. Both the front and rear bumpers are attached to the chassis through bonded metal-and-rubber shock absorbers which are bolted to the front and rear chassis extensions. A front shock absorber unit is shown in Fig. 31.

The second type of bumper is attached to the chassis frame through shock absorbers in an identical manner to the first type. Reference to Fig. 30 will show that these bumpers are painted and incorporate a chromium-plated bumper bar. Like the first type of bumper, the stop, tail and reverse lights are housed in the rear bumper.

The third type of bumper, shown in Fig. 32, is fitted to all type 401 cars subsequent to the 125th (Chassis No. 696 onwards). These bumpers are painted and incorporate a chromium-plated bumper bar, but the rear bumper does not house the stop, tail and reverse lamps, which are incorporated in the rear wings. In addition, there are no rubber shock absorber units, the bumpers being mounted on spring steel bars.

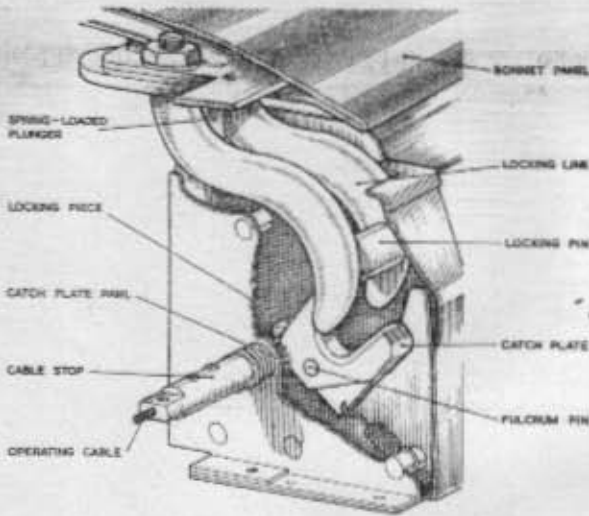


Fig.26. Bonnet Lock Operation (Bonnet released).

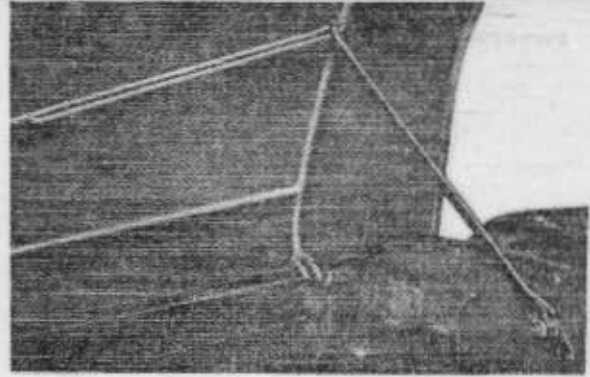


Fig.27. Bonnet Stay Details.

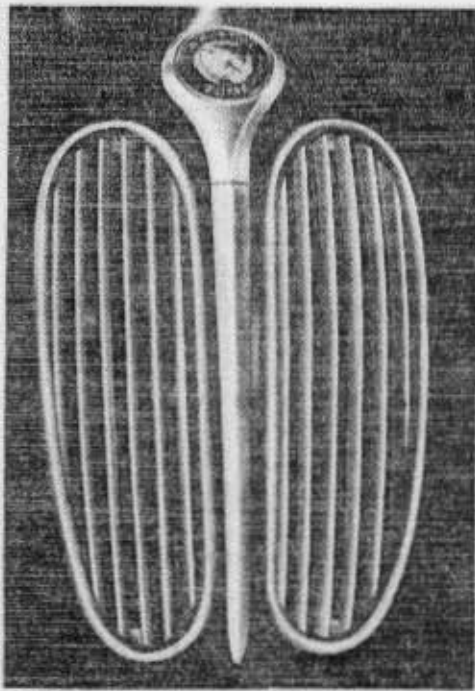


Fig.28. Radiator Grille Details.

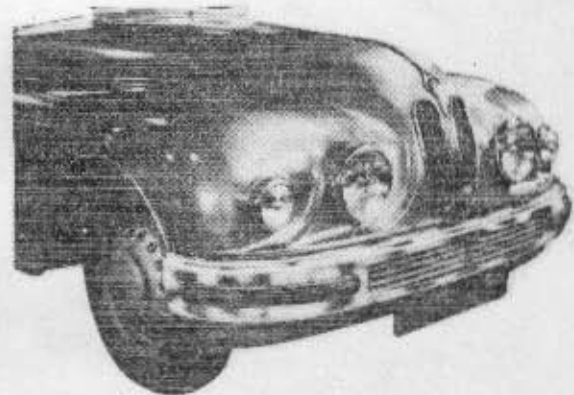


Fig.29. Bumper Details.



Fig.30. Bumper Details (2nd Type).

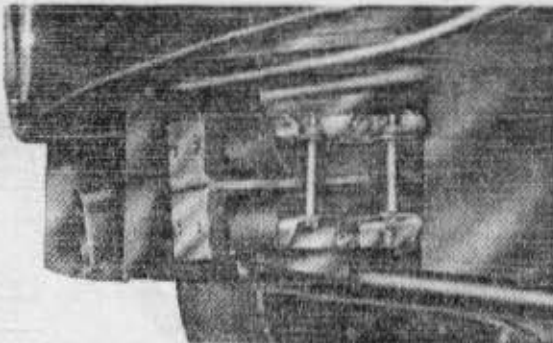


Fig.31. Bumper Shock Absorbers.

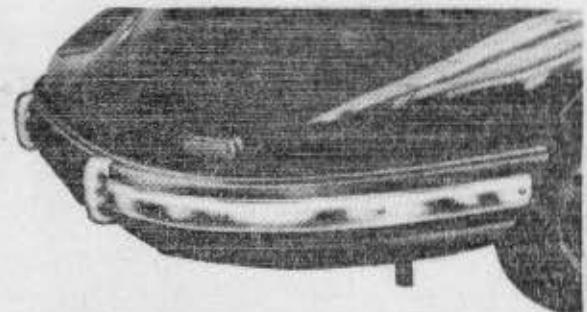


Fig.32. Bumper Details (3rd Type).

On and from Chassis No.1006, strengthened over-riders, incorporating holes for towing purposes are fitted. This type of over-rider can be fitted to cars embodying earlier type bumpers, but additional holes will have to be cut in the bumpers to accommodate the extra mounting bolts of each over-rider.

Irrespective of type, all front bumpers embody two vane units located in the central aperture of the bumper. A diaphragm is fitted immediately to the rear of the vane units, and air entering through the vanes is directed upwards by the diaphragm to the radiator matrix, thus augmenting the main flow of air through the radiator grille.

Removing and refitting
(1st and 2nd types)

To remove the front bumper, proceed as follows :-

1. Jack up the front of the car, then slacken the four 2 B.A. nuts at the base of the two vane units in the central aperture of the bumper, see Fig.33, and withdraw the units from their forked attachment brackets to provide access to the bumper retaining bolts.
2. Support the bumper and remove the eight 5/16in. set-bolts and shake-proof washers securing the bumper to the shock absorbers.
3. Lower the bumper away from the car.

To refit the bumper, reverse the foregoing sequence.

When removing the rear bumper, adopt the following procedure :-

1. Jack up the rear of the car.
2. Remove the stop, tail and reverse light units and trays (see Section 13) to provide access to the bumper retaining bolts.
3. Working through the apertures, remove the eight 5/16in. set-bolts and shake-proof washers securing the bumper to the shock absorbers.

4. Ease the bumper assembly rearwards and on the right-hand side, until access is provided to the snap connector of the rear light cable loom, then uncouple the cable.
5. Ease the bumper assembly rearwards still further until it can be withdrawn from the rear of the car. The rear light loom will remain attached to the bumper.

Reverse the foregoing sequence to refit the bumper.

Removing and refitting (3rd type)

To remove the front bumper, proceed as follows :-

1. Jack up the front of the car.
2. Support the bumper and, working underneath the front of the car, remove the four $\frac{5}{8}$ in. "Simmonds" nuts, washers, bolts and distance washers securing the bumper spring bars to each chassis side frame extension.
3. Note the number of distance washers removed from each bolt location, then lower the bumper assembly and remove it from the car.

To refit the bumper, reverse the foregoing sequence, but take care to refit the correct number of packing washers, as noted, to each retaining bolt location.

To remove the rear bumper, proceed as follows :-

1. Jack up the rear of the car.
2. Remove the fifteen 2 B.A. mushroom-head set-screws securing each of the bumper side valances and detach the valances. This will provide access to the rear light loom snap connector and the bumper spring retaining bolts.
3. Uncouple the snap connector under the right-hand rear wing then remove the two $\frac{5}{8}$ in. "Simmonds" nuts, plain washers, bolts and distance washers, and the single $\frac{5}{8}$ in. set-bolt, plain washer, double-spring washer and distance washers securing the bumper spring bars to the side of each chassis frame extension. Note the number of distance washers removed from each bolt location.

4. Ease the bumper assembly rearwards out of position until it can be withdrawn easily. The rear light cable loom will remain attached to the bumper.

Reverse the foregoing procedure to refit the bumper, but take care to fit the correct number of packing washers, as noted, to each retaining bolt location.

Dismantling

The following paragraphs describe the methods of removing the various bumper components to permit repairs and for replacements to be effected.

- (a) 1st. and 2nd. types. To dismantle a front bumper vane unit, remove the 2 B.A. nuts and washers from the two long bolts, withdraw the bolts and separate the four vanes and interposed spacing washers. Take care not to lose any of the washers.

To remove the bumper bottom valance, remove the 2 B.A. bolts, shake-proof washers and nuts from the mating flanges of the bumper and valance and separate the two components. When removing the valance from the front bumper, the front registration plate carrier will be freed as the three centre bolts are withdrawn.

To detach an over-rider, remove the three $\frac{3}{8}$ in. B.S.F. nuts, shake-proof washers and packing pieces from the inside face of the bumper, then withdraw the over-rider complete with attachment bolts.

To remove the moulded rubber strip from the first type bumper, prise the strip carefully from its rolled section carrier. The carrier is riveted to the bumper.

When removing the chromium-plated bumper bar from the second type bumper, remove the $\frac{3}{8}$ in. B.S.F. nuts, washers and round-head bolts securing the bar to the bumper, and prise away the bar. If this last operation is performed carefully, the $\frac{1}{2}$ in. dia. P.V.C. beading will remain attached to the bar. Should however, the beading not remain adhering to the bar, it must be removed and a new length fitted after any necessary repair work has been carried out on the bumper bar.

If it is required to remove the bumper mounting brackets, the "Parker-Kalon" round-head screws securing the moulded rubber sealing strip and aluminium attachment strip to the top of the bumper must first be removed, and the strips detached to provide access to the $\frac{1}{4}$ in. B.S.F. countersunk-head screws, shake-proof washers and nuts securing the brackets to the bumper.

- (b) 3rd. type. The dismantling methods given for the 1st. and 2nd. types of bumper may be applied in general to this type of bumper except that the removal of the bumper attachment brackets does not apply, these bumpers being attached to the chassis by spring bars, which are secured to the bumper by the over-rider centre retaining bolts and the bolts attaching the bumper bars to the bumper.

Repairs

Repairs will, in the main, consist of removing indentations and re-touching the paintwork, or by removal and direct replacement of a damaged component, such as a plated bumper bar or over-rider. The methods for removing the various components are given previously under "Dismantling the bumpers", and the sequence should be reversed when fitting replacements. Wherever practicable, it is recommended that a damaged bumper is repaired, rather than discarded and completely replaced.

Note :- Mating faces of light-alloy to steel must be coated with "Duralac" paint on assembly, to prevent corrosion due to electrolytic action.

Where the rubber shock absorbers of the 1st and 2nd type bumpers have been distorted slightly by impact, it is permissible to straighten the attachment flanges or "blade" portion. This should preferably be carried out with the units in position. Discretion must, however, be exercised when attempting this operation, since a severe impact load may not only have distorted the shock

absorber unit, but also have been transferred to the chassis. Therefore, where any doubt exists concerning the serviceability of the shock absorbers, or the extent of the impact loading, fit replacement shock absorber units and examine the chassis extensions for signs of shock damage.

With regard to the first type (chromium-plated) bumper, it is not considered economical to attempt to repair and re-plate the bumper. It is recommended that a damaged bumper is removed, stripped of chromium-plating, then repaired and re-built to conform to the later type in which the bumpers are painted to match the coachwork. The chromium-plated bumper bars and over-riders, as fitted to the second type bumper, may then be fitted, or the rubber cushion beading replaced. If desired, the painting can be omitted and the bumper highly polished. The sequence to be adopted for this type of bumper is therefore as follows :-

1. Remove the complete bumper from the car, as described in page 61, then dismantle the assembly (see page 63) removing all steel attachments; detach also the two cast end pieces by removing the eight "Parker-Kalon" screws.
2. Strip off all chromium-plating, then carry out the welding and planishing operations necessary to repair the bumper.
3. Refit the bumper attachment brackets, offer the bumper to the car and check for satisfactory fit.
4. Refit the end pieces and steel fittings and re-rivet the vane mountings in position when dealing with a front bumper.
5. (a) Polish the aluminium bumper and fit replacement rubber beading and moulded cushion beading as described in subsequent paragraphs.

or

- (b) If it is desired to paint the bumper and fit chromium-plated bumper bars, cut suitable blanks from 10 S.W.G. aluminium sheet and rivet them to the inside face of the bumper to close the apertures through which the cushion bead passed originally. Locate the bumper bars in position and drill all the attachment bolt

holes. Paint the bumper to match the car and when dry, fit P.V.C. beading to the bumper bars (see "Replacing bumper bar beading") and assemble the strips and over-riders to the bumper.

6. Complete the re-assembly of the bumper, then fit it to the car.

Replacing moulded rubber cushion beading (1st type bumper)

This replacement can be carried out with the bumper in situ. To remove the rubber, ease one edge out of the rolled section carrier, then working carefully along the length of the section, draw the rejected beading out of the carrier.

There are two methods of fitting a length of replacement cushion beading. The first method is to apply a smear of light grease to the lips of the carrier, then, working on the inside of the bumper, locate one end of the strip between the lips of the carrier and work the beading along the carrier into position. The second method is to locate one edge of the replacement strip under a lip of the carrier along its entire length, then ease the other edge of the section under the remaining lip of the carrier.

Replacing bumper bar beading (2nd and 3rd type bumpers)

This can only be done with the bumper removed from the car. Proceed as follows :-

1. Remove the plated bumper bar as described under "Dismantling the bumper", removing also the over-rider(s) if necessary.
2. Remove all trace of the unserviceable beading and clean the location thoroughly with methylated spirit.
3. Offer a new length of beading to the bar and mitre-cut the beading strip at the corners, arranging the joint on the bottom run of the beading.

4. Apply an even coating of "Bostik C" adhesive to the beading location on the rear face of the bumper bar, and press the beading firmly into position, making sure that the bead lies evenly along the edge of the bar.
5. Re-assemble the bumper bar to the bumper.

Replacing bumpers

Referring to the notes on repair on page 64, where instances arise in which it is considered impracticable to repair a bumper, the following notes are given as a guide to replacement.

1. Replacement bumpers of the third type incorporating spring steel bars can be supplied ready for fitment to the car on and from Chassis No. 906.
2. Prior to Chassis No. 906, replacement bumpers cannot be supplied as complete units. The bumper is supplied as a bare extrusion with the necessary apertures cut, but the ends are left untrimmed and no holes are drilled. All other components of the assembly are supplied ready for fitment and the bumper must be cut and drilled, using the appropriate items as templates, then the assembly completed before the bumper is fitted finally to the car.

Instructions for the replacement of the 1st and 2nd type bumpers are given herewith in detail.

(a) 1st type front bumper

1. Secure the bumper mounting brackets temporarily to the front face of the shock absorber units.
2. Offer the bumper section to the brackets, making sure that the bumper aligns with the front contour of the car.
3. Working through the vane apertures in the bumper, scribe lines on the inside face of the bumper to coincide with the inner edge of the two mounting brackets.

4. Still retaining the bumper in position, mark off the ends of the bumper conforming to the wheel apertures of the wings.
5. Remove the bumper and detach the two mounting brackets.
6. Trim off the surplus material from the ends of the bumper, taking care to maintain the wing shape referred to in item 4.
7. Now locate the two mounting brackets within the bumper section, aligning the inner edges with the scribed lines; mark the bracket retaining bolt holes in the bumper, then remove the brackets. Drill the bolt holes (letter "F" drill, 0.257in. dia.), and countersink 90° for full depth of section.
8. Position the cast end pieces in the bumper section, then drill through the bumper into each end piece at two locations at both the top and bottom faces of the bumper (No.18 drill, 0.1695in. dia.). Secure the end pieces to the bumper with eight type "Z" "Parker-Kalon" countersunk-head screws, $\frac{3}{4}$ in. long.
9. Trim away the ends of the bumper to conform to the end piece contours.
10. Offer the bottom fairing to the bumper, check the two components for correct relationship, then mark and drill the fairing retaining bolt holes (No.12 drill, 0.189in. dia.).
11. Assemble the two vane units together with their mounting brackets.
12. Secure the bumper mounting brackets temporarily to the bumper, then locate the two vane units in position. Mark the position of the rivet holes in the four inner vane mounting brackets on the bumper, and scribe the position of the four outer vane mounting brackets on the bumper mounting brackets.
13. Remove the vane units and bumper mounting brackets; mark each vane unit bracket with its position, then dismantle the vane units.
14. Drill the rivet holes in the bumper for the four inner vane brackets (No.30 drill, 0.1285in. dia.).
15. Weld the four outer vane brackets in their correct positions on the bumper mounting brackets.
16. Position the cushion bead carriers on the bumper; mark and drill the carrier rivet holes in the bumper (No.30 drill, 0.1285in. dia.).
17. Chromium-plate or polish the bumper and bottom fairing.
18. Rivet the cushion bead carriers in position.

19. Rivet the inner vane mounting brackets in position.
20. Assemble the bottom fairing and front registration plate carrier to the bumper.
21. Fit and secure the two bumper mounting brackets.
22. Temporarily fit the bumper to the car, then scribe the front contour of the bonnet and wings lightly on the top edge of the bumper; remove the bumper.
23. Apply "Bostik" adhesive to the replacement moulded rubber sealing strip and locate the strip on the top edge of the bumper, pressing it firmly into position and making sure that the front face of the seal conforms to the line scribed on the bumper.
24. Allow the adhesive to set, then position the light-alloy retaining strip over the rubber seal, drill through the holes in the strip into the rubber and the top edge of the bumper (No.24 drill 0.152in. dia.), then secure the strip in position with type "Z", size 8, round-head "Parker-Kalon" screws, $\frac{1}{2}$ in. long.
25. Assemble the bumper finally to the car, then fit cushion beads and vane units as described in pages 66 and 68 respectively.

(b) 1st type rear bumper

1. Secure the bumper mounting brackets temporarily to the shock absorber units.
2. Offer the replacement bumper section to the brackets, making sure that it aligns with the rear contour of the car.
3. Working through the lamp apertures on each side of the bumper, scribe lines on the inside face of the section to coincide with the inner edge of the two mounting brackets.
4. Still retaining the bumper in position, mark off the ends of the bumper, conforming to the wheel apertures in the rear wings.
5. Remove the bumper and detach the two mounting brackets.
6. Trim off the surplus material from the ends of the bumper, taking care to maintain the wing shape referred to in item 4.
7. Now locate the two mounting brackets within the bumper section, aligning their inner edges with the scribed lines; mark the bracket retaining bolt holes in the bumper, then remove the brackets. Drill the bolt holes (letter "F" drill, 0.257in. dia.), countersinking 90° for full thickness of section.

8. Position the cast end pieces in the bumper section, then drill through the bumper into each end piece at two locations at both the top and bottom faces (No.18 drill, 0.1695in. dia.). Countersink the holes 90° to a depth of 0.082in. Secure the end pieces to the bumper with eight type "Z" "Parker-Kalon" countersink-head screws, $\frac{3}{4}$ in. long.
9. Trim away the ends of the bumper to conform to the end piece contours.
10. Position each rear lamp box assembly in its aperture in the sides of the bumper, mark the position of the retaining bolt holes, then drill the holes (No.11 drill, 0.191in. dia.), and countersink 90° to a depth of 0.080in.
11. Assemble the registration plate carrier to its attachment bracket, position the assembly in the central aperture of the bumper section; mark and drill the bracket rivet holes in the section (No.30 drill, 0.1285in. dia.), countersinking 90° to a depth of 0.043in.
12. Now measure the distance from the front face of each wing rear diaphragm to the edge of the wheel aperture in the wing; transfer these dimensions to the corresponding ends of the bumper and mark the two positions.
13. Position the two diaphragm sealing strip brackets within the bumper section, aligning them with the two marks, then mark and drill the rivet holes in the section (No.30 drill, 0.1285in. dia.), countersinking 90° to a depth of 0.043in.
14. Locate the two cushion bead carriers in position on the bumper and mark and drill the rivet holes in the section (No.30 drill, 0.1285in. dia.).
15. Chromium-plate or polish the bumper section.
16. Secure the two bumper mounting brackets to the bumper.
17. Secure the two wing diaphragm sealing strips to their brackets with the 2 B.A. bolts, washers and nuts, then locate the units within the bumper section and rivet in position.
18. Offer the bumper to the rear of the car and secure temporarily in position. Now scribe the rear contour of the car lightly on the top and bottom of the bumper; remove the bumper.
19. Apply "Bostik" adhesive to the replacement moulded rubber sealing strips and locate them on the top and bottom faces of the bumper, pressing them firmly into position and making sure that they conform to the lines scribed on the bumper.

20. Allow the adhesive to set, then position the light-alloy retaining strips over the rubber seals, drill through the holes in the strips into the rubber and bumper (No. 24 drill, 0.152 in. dia.), then secure the strips in position with Type "Z", size 8, round-head "Parker-Kalon" screws, $\frac{1}{2}$ in. long.
21. Rivet the registration plate carrier brackets in position, then assemble the bumper finally to the car, fitting the two lamp units and making the necessary electrical connections as described in Section 13.
22. Bolt the registration plate carrier in position, then fit the rubber cushion beads as described in page 66.

(c) 2nd type front bumper

1. Secure the two bumper mounting brackets temporarily to the front face of the bumper.
2. Offer the bumper section to the brackets, making sure that the bumper aligns with the front contour of the car.
3. Working through the vane aperture, scribe lines on the inside face of the bumper to coincide with the inner edges of the mounting brackets.
4. Still retaining the bumper in position, mark off the ends of the bumper conforming to the wheel apertures of the wings.
5. Remove the bumper, and detach the mounting brackets.
6. Trim the surplus material from the ends of the bumper, then locate the two mounting brackets within the section, taking care to maintain the wing shape referred to in item 4.
7. Mark and drill the bracket retaining bolt holes in the top and bottom faces of the bumper (letter "F" drill, 0.257 in. dia), then countersink the holes 90° for the full thickness of the metal.
8. Offer the bottom fairing to the bumper, make sure that the two components align correctly, then mark and drill the fairing retaining bolt holes in the bumper (No. 12 drill, 0.189 in. dia).
9. From the material supplied with the bumper section, cut two end pieces, conforming to the profile of the bumper. Weld these end pieces into position, then dress the weld fillets neatly with a file and emery cloth.
10. Assemble the two vane units, together with their mounting brackets.

11. Secure the two bumper mounting brackets temporarily to the bumper, then locate the vane units in position. Mark the position of the rivet holes in the four inner vane mounting brackets on the bumper mounting brackets.
12. Remove the vane units and bumper mounting brackets; mark each vane unit bracket with its position, then dismantle the vane unit brackets.
13. Drill the rivet holes in the bumper for the four inner vane brackets (No.30 drill, 0.1285in. dia.).
14. Weld the four outer vane brackets in their correct positions on the bumper mounting brackets.
15. Position the chromium-plated bumper bars, in turn, squarely on the bumper, mark the positions of the securing bolt holes, then drill (letter "V" drill, 0.377in. dia.).
16. Rivet the inner vane mounting brackets into position.
17. Paint the bumper and bottom fairing to match the colour of the car.
18. Fit and secure the two bumper mounting brackets.
19. Assemble the bottom fairing and front registration plate carrier to the bumper.
20. Fit the P.V.C. beading to the edges of the chromium-plated bumper bars and assemble to the bumper together with the over-riders as described under "Replacing bumper bar beading" on page 66.
21. Temporarily fit the bumper to the car, then mark the front contour of the bonnet and wings lightly on the top edge of the bumper; remove the bumper.
22. Apply "Bostik" adhesive to the replacement moulded rubber sealing strip, and locate the strip on the top edge of the bumper, pressing it firmly into position and making sure that the front edge of the seal conforms to the line marked on the bumper.
23. Allow the adhesive to set, then position the light-alloy retaining strip over the rubber seal, drill through the holes in the strip into the rubber and top edge of the bumper (No.24 drill, 0.152in. dia.), then secure the strip in position with type "Z", size 8, round-head "Parker-Kalon" screws $\frac{1}{2}$ in. long.

(d) 2nd type rear bumper

1. Secure the bumper mounting brackets temporarily to the shock absorber units, then offer the replacement bumper section to the brackets, making sure that it aligns with the rear contour of the car.
2. Working through the lamp apertures on each side of the bumper, scribe lines on the inside face of the section to coincide with the inner edge of the two mounting brackets.
3. Still retaining the bumper in position, mark off the ends of the bumper conforming to the wheel apertures of the rear wings.
4. Remove the bumper and detach the two mounting brackets.
5. Locate the two mounting brackets within the bumper section, aligning their inner edges with the scribed lines; mark and drill the bracket retaining bolt holes in the bumper (letter "F" drill, 0.257in. dia.). Countersink the holes 90° for the full thickness of the section.
6. Trim off the surplus material from the ends of the bumper, taking care to maintain the wing shape referred to in item 3, then, from the material supplied with the section, cut two end pieces conforming to the profile of the bumper.
7. Weld the end pieces into position, then dress the weld fillets neatly with a file and emery cloth.
8. Position each rear lamp box assembly in its aperture in the sides of the bumper, mark the holes, then drill the holes (No. 11 drill, 0.191in. dia.), and countersink 90° to a depth of 0.080in.
9. Assemble the registration plate carrier to its attachment bracket, position the assembly in the central aperture of the bumper; mark and drill the bracket rivet holes in the section (No. 30 drill, 0.1285in. dia.), and countersink 90° to a depth of 0.043in.
10. Separate the carrier and its attachment bracket and rivet the bracket into position.
11. Now measure the distance from the front face of each wing rear diaphragm to the edge of the wheel aperture of the wing; transfer these dimensions to the corresponding ends of the bumper and mark the two positions.
12. Position the two diaphragm sealing strip brackets within the bumper section, aligning them with the two marks, then mark and drill the rivet holes in the section (No. 30 drill, 0.1285in. dia.), and countersinking the holes 90° to a depth of 0.043in.

13. Secure the two wing diaphragm sealing strips to their brackets with the 2 B.A. bolts, washers and nuts, then locate the units within the bumper section and rivet in position.
14. Locate each chromium-plated bumper bar, in turn, squarely in position on the bumper, then mark and drill the retaining bolt holes (letter "V" drill, 0.377in. dia.).
15. Paint the bumper to match the colour of the car.
16. Fit and secure the two bumper mounting brackets.
17. Fit the P.V.C. beading to the edges of the chromium-plated bumper bars and assemble to the bumper, together with the over-riders as described under "Replacing bumper bar beading" on page 66.
18. Offer the bumper to the rear of the car and secure temporarily in position. Now mark the rear contour of the car lightly on the top and bottom of the bumper; remove the bumper.
19. Apply "Bostik" adhesive to the replacement moulded rubber sealing strips, and locate them on the top and bottom faces of the bumper, pressing them firmly into position and making sure that they conform to the lines marked on the bumper.
20. Allow the adhesive to set, then position the light-alloy retaining strips over the rubber seals, drill through the holes in the strips into the rubber and bumper (No. 24 drill, 0.152in. dia.), then secure the strips in position with type "Z" size 8, round-head "Parker-Kalon" screws, $\frac{1}{2}$ in. long.
21. Bolt the registration plate carrier in position.
22. Assemble the bumper finally to the car, fitting the two lamp units and making the necessary electrical connections as described in Section 13.

WINDSCREEN (TYPE 401)

Description

The windscreen fitted to the majority of type 401 cars consists of two $\frac{1}{2}$ in. thick laminated glass panels, rubber mounted in a brass frame and divided by a centre rail. The frame is split vertically into two sections, the joint being made at the centre rail. Six attachment angles are brazed to the rear flange of

the windscreen frame and are drilled to receive the "Parker-Kalon" raised-head screws which secure the assembly in position. A moulded rubber seal is held in the outer channel of the frame and makes a water-tight and draught-proof seal with the aperture frame. A sectioned view of the windscreen is shown in Fig. 34. The centre rail is drilled and tapped to receive the mounting screws of the rear vision mirror. Combined side and top finishers and the facia peak mask the windscreen attachments.

A windscreen incorporating an aluminium-alloy frame was, however, fitted to cars of early production. On this type of screen, the two glass panels are separated by a moulded rubber section which is compressed to form a seal by a narrow internal centre pillar of extruded light alloy fitted on the inside face of the seal and retained in position by screws passing through the frame upper and lower tie plates. There is no external centre pillar on this type of windscreen.

Removing and refitting windscreen

To remove the windscreen, proceed as follows :-

1. Detach the windscreen wiper arms.
2. Remove the grub-screw and detach the trafficator switch lever from its spindle located centrally in the facia peak.
3. Remove the two screws from the windscreen centre rail and detach the rear vision mirror.
4. Remove the "Parker-Kalon" screw from each end of the facia peak, and the four mushroom-head screws on the underside, and withdraw the facia peak.
5. Remove the eight screws and cups and detach carefully the two combined top and side finishers.
6. Detach the two de-mist air deflectors by removing the securing screws.

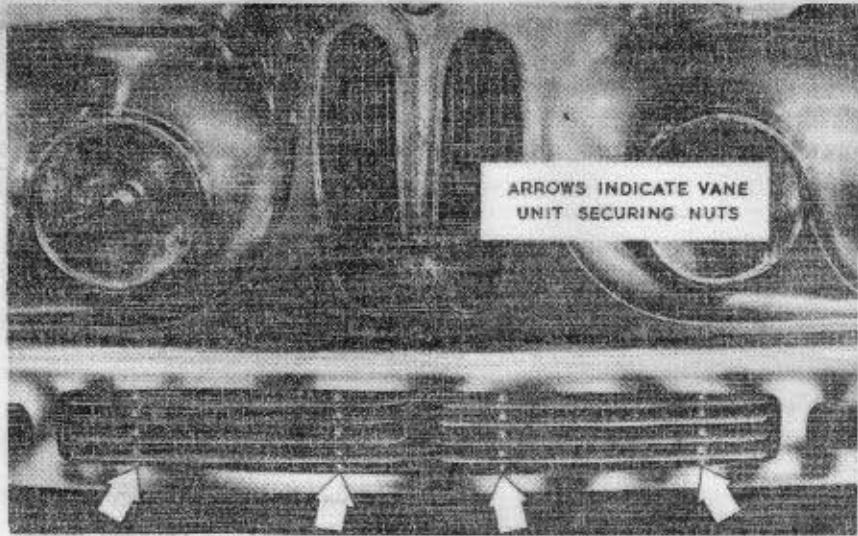


Fig.33. Location of Vane Unit Retaining Nuts.

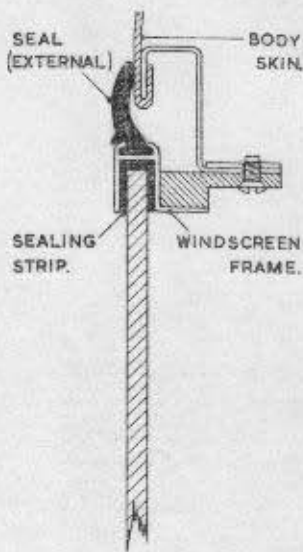
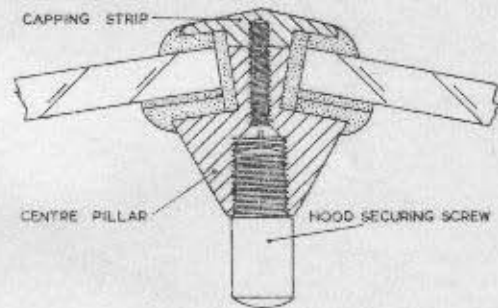
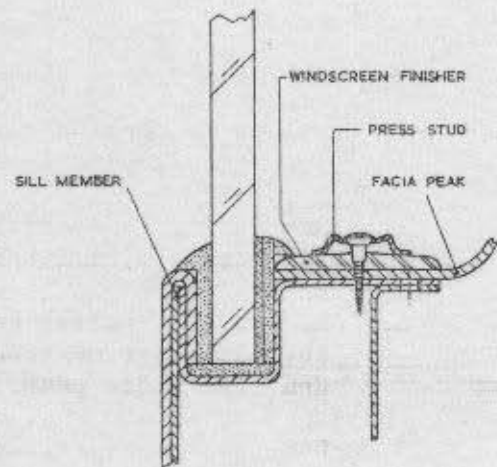


Fig.35. Sectioned views of Windscreen.



HORIZONTAL SECTION THROUGH CENTRE PILLAR



VERTICAL SECTION THROUGH BASE

Fig.34. Sectioned view of Windscreen.

7. Examine the wood fillets fitted around the inside of the windscreen aperture. If holes are drilled in the fillets to provide access to the six windscreen securing screws, remove the screws, slacken slightly the fillet securing screws, then lift away the windscreen assembly. If, however, access holes have not been drilled in the fillets, remove the fillets, then ease the interior trimming material away from the windscreen aperture until access has been gained to the six windscreen securing screws.

To refit the windscreen, reverse the foregoing procedure, but take care to re-position the trimming material evenly in instances where it has been detached to provide access to the windscreen securing screws. Note also that the external sealing strip should be renewed before refitting the screen if it shows any signs of cracking or perishing; this procedure is described subsequently.

Replacing windscreen glass

To fit a replacement windscreen glass, first remove the assembly as described previously, then dismantle the windscreen in the following manner :-

1. Extract the staple from the joint in the sealing strip fitted around the rim of the windscreen frame, then ease the rubber out of the frame channel section; discard the sealing strip if unserviceable.
2. Remove the four screws from the back of the frame joint plates at the top and bottom of the centre rail, then separate the halves of the screen and detach the centre rail.
3. To remove the glass panel(s) from the frame, jar the end of the frame on the edge of the bench to dislodge the glass partially, then tap the panel out of the frame with a rubber mallet; discard the glazing rubber.

Next, prepare and fit the replacement glass as follows :-

1. Fit a replacement glazing rubber to the new glass panel and tap the panel gently into the frame, making sure that the glazing strip is not displaced or distorted during the operation.

2. Locate the right and left-hand panels together with the centre rail interposed, then refit and tighten the joint plate screws.
3. Fit a replacement or the existing external sealing strip (according to condition) to the rim of the windscreen frame, easing the strip carefully into the frame channel section and arranging the joint at the bottom of the frame.
4. Make sure that the strip is not distorted, then insert the staple.
5. Fit a small rubber patch over the joint using "Bostik C" adhesive, then re-assemble the windscreen to the car as described previously.

WINDSCREEN (TYPE 402)

Description

The windscreen is of the frameless type and comprises two $\frac{1}{4}$ in. thick laminated glass panels which are rubber mounted between the two side pillars and a non-detachable centre pillar. Sections through the windscreen at the base and centre pillar locations are shown in Fig. 35.

Replacing windscreen glass

First, remove the damaged panel in the following manner :-

1. Remove the cover plates from the centre and side pillars and unscrew the hood securing hook from the top of the centre pillar.
2. Remove the two countersunk-head screws and detach the rear vision mirror from the screen centre pillar.
3. Remove the "Parker-Kalon" screws, the toneau cover press-stud attachments and the mushroom-head set-screws and detach the windscreen finishers and the facia peak.
4. Unscrew the five 4 B.A. set-screws fitted to the rear face of the centre pillar (the top screw is contained within the threaded hole which accommodates the hood securing hook), and detach the capping strip from the front face of the pillar.

5. Ease the unserviceable glass away from the centre pillar and remove the panel carefully.
6. Remove and discard all rubber sealing strips.
7. Refit the centre pillar capping strip, followed by the fascia peak, finishers, hood attachment hook and pillar cover plates.
8. Clean the sealing strip locations thoroughly, then fit replacement flat rubber strip (0.060in. thick) to the well of the channels in the pillars and sill, and moulded rubber sealing strips to the sides of the channels, securing them in position with "Bostik" adhesive.
9. Apply "Dum-Dum" sealing compound to the recesses formed between the sealing strips and tap the replacement glass into position with a rubber mallet, making sure that the seals are not displaced during the operation.
10. Make sure that the replacement glass has been inserted fully between the pillars and that an efficient seal is made between the glass panel, sealing strips and body skin; clean away any excess sealing compound from the joints.
11. Refit the rear vision mirror to the centre pillar.

DOORS

Description

The doors fitted to the type 402 tourer are similar in general construction to those fitted to the type 401 saloon, except that window frames are not fitted. A general description of the type 401 doors is given herewith.

The two light-alloy panel doors are built up on a welded tubular steel reinforcing framework with wooden fairings. Each door embodies a full width, vertical sliding "Triplex" glass panel, the regulator mechanism of which is bolted to the two vertical reinforcing members, see Fig.37. A large single-piece trimming panel incorporating a two-compartment side pocket is secured to the inside of the door with "Phillips" screws.

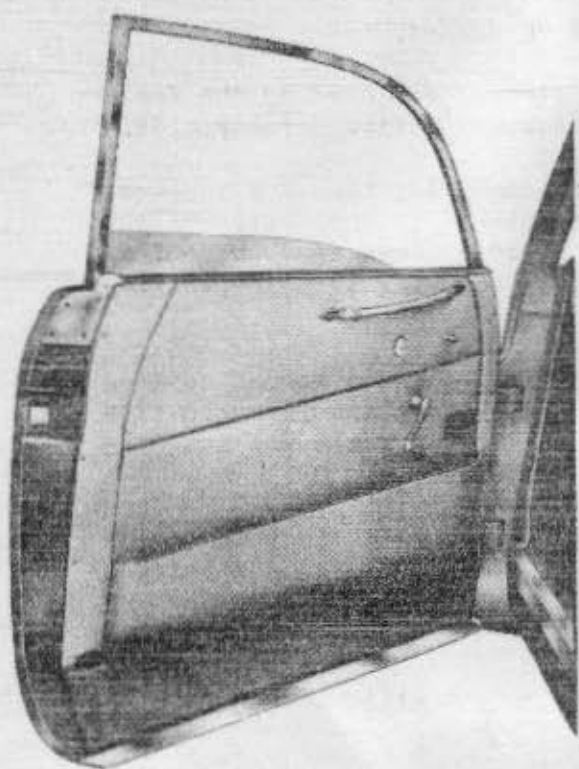


Fig. 36. Door details.

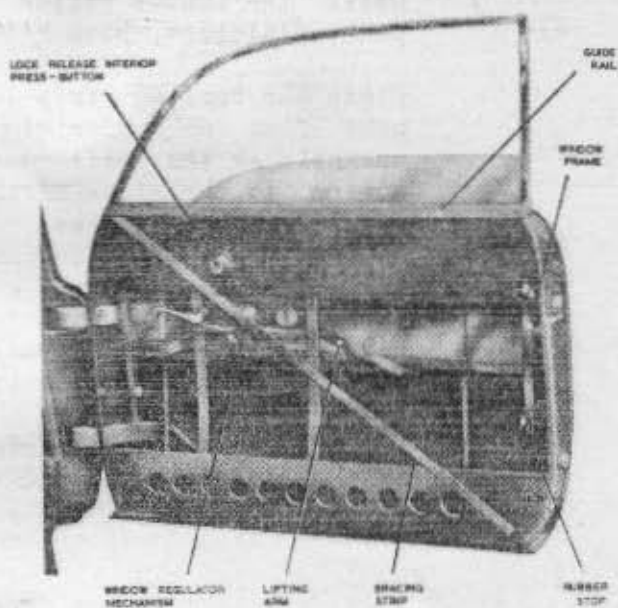


Fig. 37. Door details (trim panel removed)



Fig. 38. Door Assister Spring Assembly.

The doors are hinged at their front ends, the box section hinges being welded to the tubular framework and the front frame members; their forward ends are housed in hinge boxes welded to the forward face of each front door pillar. Two "Oilite" self-lubricating bushes are fitted to each hinge, those of the upper hinge being flanged.

The lower hinge boxes embody a door assister spring and stop unit which operates in conjunction with the door lock; a general view of the assembly is shown in Fig.38 and a section plan view in Fig.39. The mechanism functions in the following manner.

When the door is closed fully, as shown in the right-hand illustration of Fig.39, the assister spring is held under compression by the eyebolt shoulder contacting the spring retaining collar. Note also that the door retaining nut is clear of the retaining spring. Referring now to the left-hand illustration, as the push-button door lock is operated, the load on the assister spring is released and the spring propels the eyebolt rearwards until the spring and its retaining collar contact the front face of the hinge box. The eyebolt being pivoted to the hinge, rearward movement opens the door partially, and as the door is opened further the door retaining nut is drawn into engagement with the door retaining spring, thus holding the door in the fully-open position. The position of the retaining nut on the eyebolt thread can be adjusted to provide greater or lesser door opening.

Each door is fitted with an interior and an exterior press-button which operates the lock mechanism. The interior press-button is situated near the forward end of each door, and operates the lock by remote control via a cable mechanism, see Fig.40. The exterior press-button is fitted with a trip finger

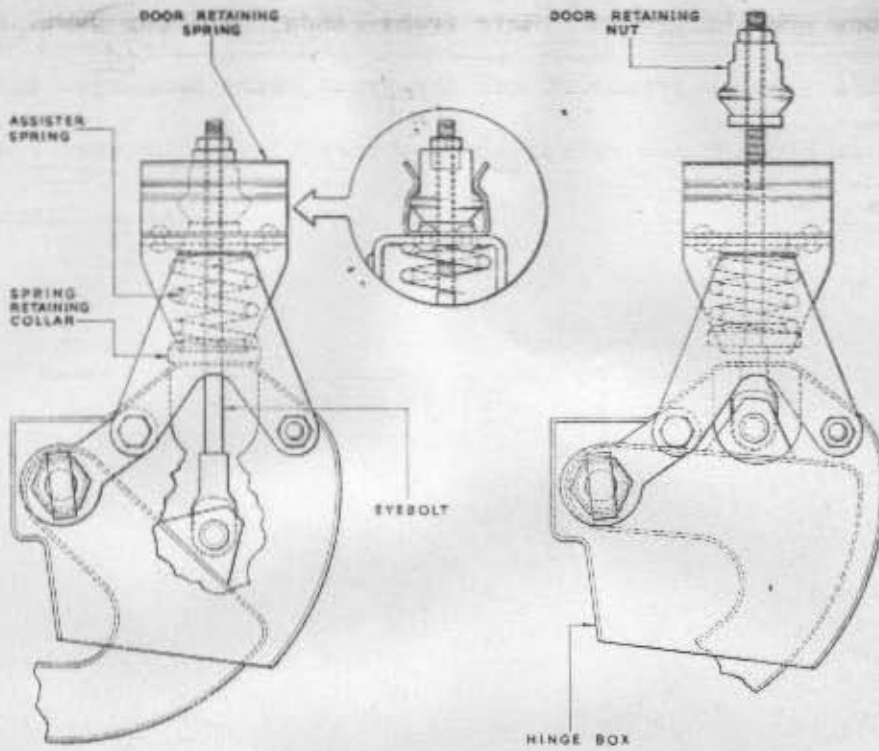


Fig.39. Operation of Door Assister Spring and Stop Unit.

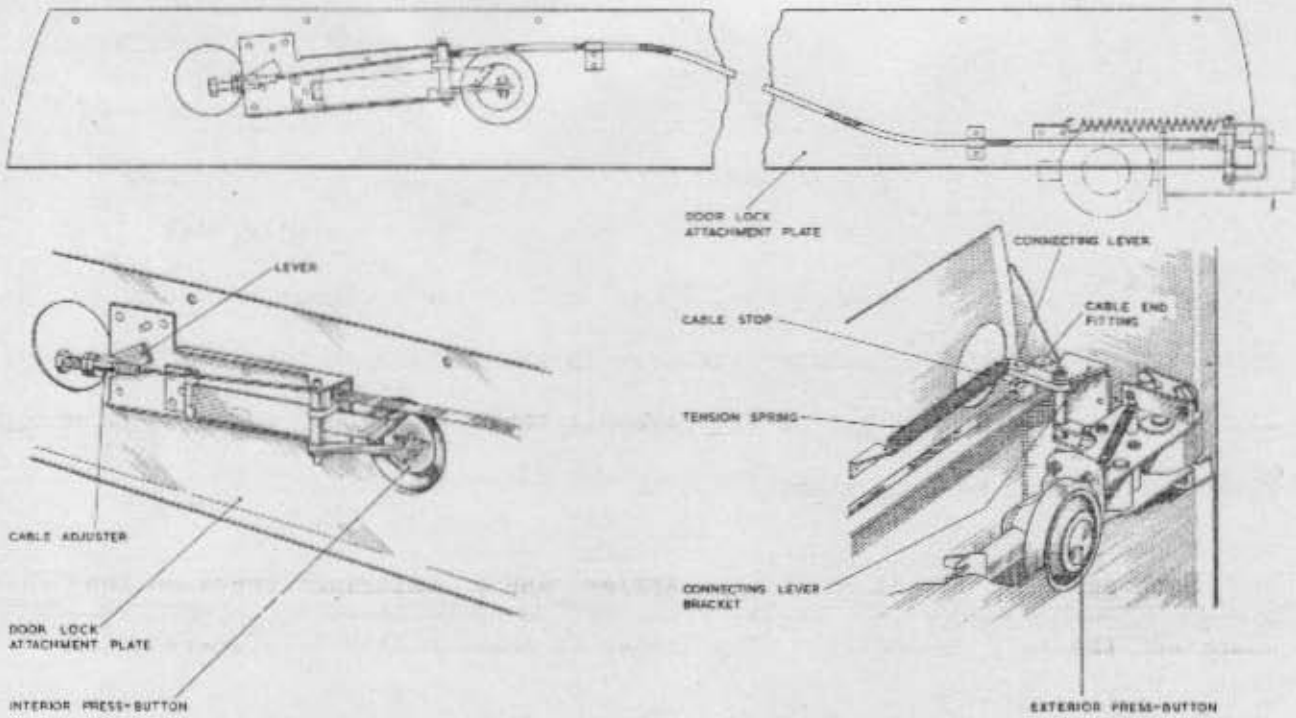


Fig.40. Cable Operated Door Lock details.

which actuates the trip panel of the lock by direct contact. A small handle fitted forward of the exterior press-button on the passenger's door is connected to a lever which carries the cable adjuster; when the handle is turned to the "LOCK" position, all tension on the cable is released and the lock becomes inoperative by the interior and exterior buttons. This device is not fitted to the driver's door, which has a tumbler type lock incorporated in the exterior press-button. When the key is inserted to lock the door, rotation of the key moves the trip finger out of engagement with the trip lever, thereby rendering the lock inoperative by the exterior button.

Adjusting door stop

The position at which the door is fully open and held by the door retaining nut can be adjusted in the following manner :-

1. Open the door and remove the front seat to increase accessibility.
2. Lift up the floor carpet and remove the three screws securing the rear edge of the anemostat panel to the door pillar, and the two small screws securing the panel attachment bracket at its lower forward corner to the toeboard extension. Detach the panel to obtain access to the door assister spring unit.
3. Close the door and wipe away the grease from the door retaining nut, its lock-nut and the threaded portion of the eyebolt.
4. Release the lock-nut, then with a spanner applied to the flats on the door retaining nut, regulate its position on the eyebolt until the desired fully-open position is obtained.
5. Hold the retaining nut and tighten the lock-nut, then coat the nut and eyebolt with grease, and check that when the door is opened fully, the retaining nut is gripped securely by the retaining spring.
6. Refit the anemostat panel, re-position the floor carpet and refit the front seat.

Adjusting door lock

It is essential to maintain the lock mechanism adjusted correctly, since excessive tightening of the cable adjuster will cause insufficient engagement of the lock pawl with the bolt and, in extreme cases, prevent effective locking of the door. If, however, the operating cable is allowed to become slack due to insufficient tightening or to stretching, the travel of the operating buttons may be insufficient to operate the lock.

Adjust the mechanism in the following manner :-

1. Open the door and detach the trimming panel as described on page 87.
2. Close the door, then check the operation of the interior press-button by placing a straight-edge across the seal housing and button so that the button is depressed level with the edge of the housing. The mechanism is adjusted correctly if the button operates the lock between this setting and a further depression of 1/16 in.
3. If the lock operates before the straight-edge aligns the button and the housing, slacken the adjuster to relieve tension on the cable; the adjuster is accessible through the forward aperture of the door lock attachment plate.
4. If the button has to be depressed beyond the desired range, increase the tension on the cable to obtain the required setting.

Note :- When adjusting the cable tension, make sure that the adjuster lock-nut is tightened at the conclusion of the operation.

5. Next, examine the lock mechanism and check the engagement of the pawl and bolt; this must not be less than 1/16 in. If the engagement is insufficient, slacken off tension on the cable slightly to obtain correct engagement. It will usually be found, however, that correct adjustment of the cable tension will satisfy the foregoing requirements.
6. At the satisfactory conclusion of the foregoing operations, re-fit the trimming panel to the door.

Adjusting vertical sliding window

After considerable service, it may be found that the rear end of the sliding window has dropped slightly and, when wound to the fully closed position, does not fit squarely into the frame. This defect may be corrected by adjusting the position of the regulator mechanism in the door reinforcing framework; the two rearmost mounting bolt holes are elongated to permit this. Proceed as follows :-

1. Open the door and remove the interior trimming panel, as described on page 87, to obtain access to the window regulator mechanism.
2. Refit the window handle temporarily, and wind the window to the fully closed position.
3. Remove the nut, washer and bolt from the lower front corner of the mechanism mounting plate and slacken the three remaining securing nuts and bolts.
4. Press the rear end of the mounting plate upwards until the rear end of the glass panel locates squarely in the frame, then lock the mechanism in this position by tightening securely the two rearmost securing nuts and bolts, and the front upper bolt and nut.
5. Check the alignment of the bolt hole at the lower front corner of the mounting plate with the mating hole in the door framework. If necessary, elongate the hole with a round file, then fit and tighten the bolt, washer and nut.
6. Wind down the window, then wind it to its fully closed position and check that the glass panel now seats squarely in the window frame.
7. Refit the interior trimming panel.

Removing and refitting door

To remove the door, proceed as follows :-

1. Open the door and remove the front seat to improve accessibility.

2. Remove the anemostat panel (see items 1 and 2, page 108).
3. Close the door sufficiently to eject the door retaining nut from its spring, then remove the lock-nut, followed by the door retaining nut and, finally, the fibre stop washer.

Warning :- During the subsequent operations, take care not to open the door beyond its normal fully-open position, otherwise the outer panel may contact and damage the rear edge of the front wing.

4. Open the door fully and support it in this position.
5. Working at the lower hinge box location, remove the $\frac{1}{2}$ in. B.S.F. set-bolt and shake-proof washer and detach the hinge pin locking plate; withdraw the hinge pin.
6. Steady the door. then detach the locking plate and unscrew and withdraw the hinge pin from the upper hinge box.
7. Lift the door rearwards to disengage the assister spring eyebolt from the lower hinge box, then lift the door away from the car.

While the door is removed, take the opportunity to check the condition of the fibre stop washer and the door retaining spring; obtain replacements if the original components are worn or fractured. Check that the assister spring is not fractured or collapsed, and examine the eyebolt pivot pin, the hinge pins and the hinge bushes for wear. The various methods of fitting replacement hinge and assister spring unit components are dealt with on pages 95 and 96.

Refit the door in the following manner :-

1. Lubricate the hinge pins with engine oil.
2. Offer the door to the front pillar, passing the assister spring eyebolt through the bores of the spring retaining collar, then the spring, and finally through the hole in the front face of the spring housing.
3. Locate the hinges within the hinge boxes and maintain the door in this position while an assistant inserts the upper and lower hinge pins.

4. Fit the locking plates to the hinge pins and secure them with the set-bolts and shake-proof washers.
5. Close the door, then fit the fibre stop washer over the protruding end of the eyebolt. Screw on the door retaining nut until the eyebolt protrudes $\frac{1}{8}$ in. to $\frac{3}{8}$ in. beyond the front face of the nut, then check the degree of door opening.
6. Regulate the position of the door retaining nut on the eyebolt thread until the desired degree of door opening is obtained, then screw on and tighten the lock-nut against the door retaining nut.
7. Pack the assister spring assembly with grease, then refit the anemostat panel. Re-position the floor carpet and refit the front seat.

Replacing doors

In the event of damage, every attempt should be made to repair the existing door. It may well be that the outer panel will be useless, but the inner tubular structure can be repaired. Complete replacement doors cannot be supplied since, during manufacture of the car, the tubular structure is first fitted, then the outer panel fitted and clinched to suit the door aperture of the particular car. Replacement outer panels can be supplied, but must be trimmed and fitted to suit the car. When ordering a replacement outer panel, the Chassis number of the car must be quoted, since the form of the panel was changed at Chassis No. 696.

Removing and refitting door trimming panel.

The trimming panel must be removed to obtain access to the door lock mechanism and to the window regulator mechanism. The panel may be removed in the following manner :-

1. Open the door and remove the "Phillips" screws securing the front and rear door embellisher plates; detach the plates.
2. Remove the five "Phillips" screws and detach the top rail finisher.

3. Remove the securing screws and detach the door pull (if of the leather type).
4. (a) (Passenger's door only)
Unscrew the grub-screw securing the door locking handle, and withdraw the handle from its spindle.
(b) (Driver's door only).
Detach the finisher cap fitted in place of the door lock handle.
5. Remove the window winding handle by depressing the spring-loaded rose into the escutcheon to expose the locking plunger, then depress the plunger and pull off the handle.
6. Remove the screws securing the upper edge of the door carpet and ease away the carpet to obtain access to the screws securing the lower edge of the trimming panel.
7. Remove the "Phillips" screws fitted around the edge of the trimming panel and lift away the panel.

To refit the panel, reverse the foregoing sequence of operations.

Removing and refitting door lock mechanism

The mechanism should be removed in the following manner :-

1. Open the door and remove the interior trimming panel (see page 87).
2. Refit the window winding handle temporarily and wind the window to the fully closed position.
3. Slacken off the cable adjuster to its full extent and disconnect the tension spring from the connecting lever.
4. Withdraw the cable casing from the recess in the cable stop fitted to the connecting lever, then remove the cable through the slot in the stop.
5. Remove the cable end fitting from its location in the connecting lever bracket.
6. Remove the securing screws and detach the door lock attachment plate from the door.

7. Remove the "Simmonds" nut from the connecting lever pivot bolt, and withdraw the bolt from the lever and bracket.
8. Remove the large diameter circlip retaining the press-button seal and, if fitted, withdraw the alloy washer fitted behind the circlip; release the outer diameter of the seal from its housing.
9. Loosen the 5/16in. B.S.F. set-bolt securing the press-button support to the support bracket, and remove the four mushroom-head screws securing the lock to the door; remove the lock, complete with the press-button and its support.
10. Remove the four mushroom-head set-screws and detach the striker plate and its packing washer from the door pillar.

Refit the lock in the following manner :-

1. Re-assemble the lock and press-button unit to the door, and secure in position with the four mushroom-head set-screws, simultaneously locating the 5/16in. B.S.F. set-bolt in the slot of the support plate; tighten the set-bolt.
2. Press the rubber seal into position in the seal housing, locate the alloy washer (if fitted) and secure them in the housing with the large diameter circlip.
3. Align the pivot bolt holes of the connecting lever and its bracket, insert the pivot bolt, then fit the washer and "Simmonds" nut; tighten the nut.
4. Fit the door lock attachment plate to the door, and secure it with the screws.
5. Insert the cable into the slot of the cable stop, then position the cable end fitting in its location in the connecting lever bracket.
6. Connect the end of the tension spring to the hole in the end of the connecting lever.
7. Adjust the cable tension as described under "Adjusting door lock" on page 84.
8. Fit the striker plate and its original packing piece to the rear door pillar, and fit, but do not tighten the four securing set-screws.
9. Adjust the position of the striker plate so that, when closing the door, the leading edge of the lock bolt just clears the striker plate, and so that when the door is locked, there is

a small clearance between the head of the striker plate and the recess in the bolt; this setting is achieved by varying the thickness of the packing piece.

10. Now adjust the position of the striker plate in its elongated slots so that when the door is closed, the outside of the door panel is flush with the adjacent side panel of the car body; tighten the four set-screws securing the striker plate.
11. When all the foregoing adjustments have been completed, refit the interior trimming panel, followed by the components that were removed to effect removal of the panel.

Dismantling door lock

The following operations should be read in conjunction with Figs. 41 and 42.

1. With the bolt "A" of the door lock in the open position, remove the bolt tension springs "B".
2. Remove the split pin "C", then tap out the bolt pivot pin "D" and the spring anchorage pin "E"; withdraw the bolt.
3. Remove the circllet from the pivot pin "F", then tap out the pins "F" and "G"; remove the pawl trip lever mechanism. Under normal circumstances, it will be found unnecessary to dismantle this mechanism or to disconnect the compression link and the connecting lever as these parts are unlikely to wear or give trouble. They may be separated however, by removing the pivot pins "H" and "J".
4. Remove the four 2 B.A. bolts, nuts and lock-washers and detach the exterior press-button unit from the door lock frame. If the unit is from the driver's door, remove the key from the lock.
5. Release the tabwasher and remove the sleeve nut "K", then remove the trip finger "L".
6. Remove the circlip "M" and withdraw the pin lock press-button assembly from the support.

Note :- If the assembly incorporates a pin lock (driver's side only), care must be taken to ensure that the centre portion of the lock does not become displaced as this will release the tumblers and springs.

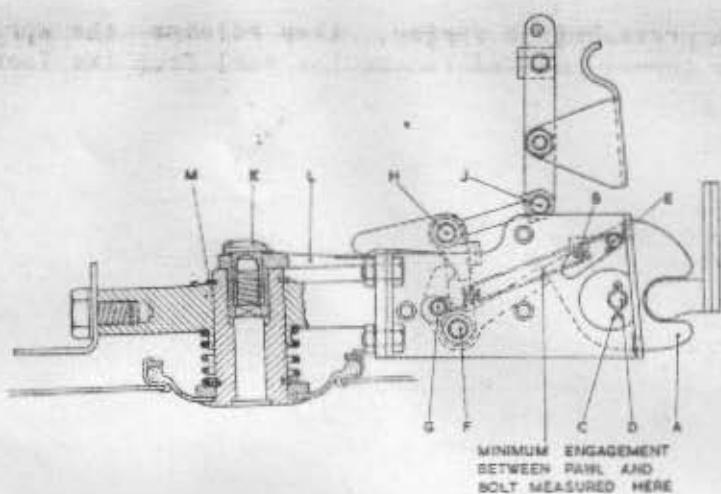


Fig.41. Sectioned view of Lock Assembly.

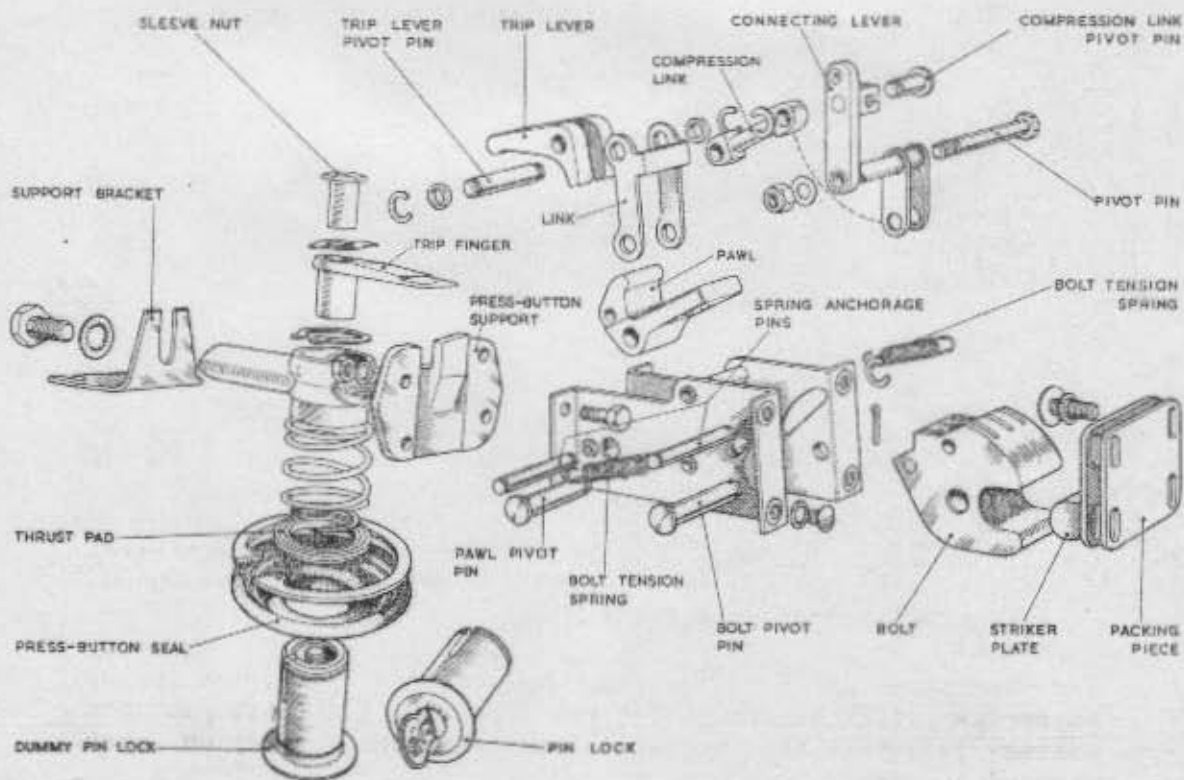


Fig.42. Door Lock Assembly.

7. Remove the press-button spring, then release the spring clip, detach the thrust pad and remove the seal from the lock housing.

Inspecting door lock

Examine the bolt, bolt pivot pin and striker plate for wear; excessive wear prevents correct functioning of the lock and entails rejection of the faulty part. Inspect the press-button seal for condition and reject if damaged or perished. Check that the bolt tension springs are satisfactory, and that they have not become stretched. If the mechanism of the pin lock is defective, it is recommended that no attempt should be made to rectify it; a new pin lock should be fitted.

Re-assembling door lock

First make sure that all necessary replacement parts have been obtained, and that all parts are clean and serviceable. Then proceed as follows :-

1. Assemble the trip lever, link and compression link, and secure them to each other with the appropriate pin, collars and circlip; Fig. 42 illustrates the location of these parts in relation to each other and to the lock frame.
2. Fit the link trip lever assembly to the lock frame, then assemble the panel between the bottom legs of the link; align the link pin holes, then insert the pin through the frame, link and pawl, and secure the pin with a circlip.
3. Fit the spring anchorage pin to the pawl via the large clearance holes of the frame, and make sure that it protrudes equally on each side of the frame.
4. Assemble the bolt to the frame and fit its pivot and spring anchorage pins, securing the pivot pin with a split pin and making sure that the anchorage pin protrudes equally on each side of the frame.
5. Check that all moving parts of the lock are free to operate satisfactorily, then fit the bolt tension springs to the pawl and bolt anchorage pins.

Warning :- During the following operations it is essential that the pin lock (driver's side only) does not become displaced.

6. Place the pin lock, or dummy pin lock assembly, threaded end uppermost, on the bench, then fit the seal and thrust pad into position with the beaded edge of the seal uppermost; secure the parts with a spring clip.
7. Locate the button spring over the barrel of the lock, then assemble the press-button support, spigot first, and engage its locating pin in the slot of the lock barrel; retain the support in position by fitting a circlip to the groove in the upper end of the barrel.
8. Fit the trip finger to the square of the pin lock so that it is parallel to the key slot of the lock.
9. Fit a new tabwasher and the sleeve nut to the bore of the trip finger and tighten the nut on the pin lock threads.
10. Check that the assembly operates freely and that the key will operate the lock and trip finger without undue pressure being applied. When this check is satisfactory, remove the key from the lock and secure the sleeve nut with the tabwasher.
11. Secure the exterior press-button unit to the door lock assembly with the four 2 B.A. bolts and nuts.
12. Finally, place the large diameter circlip and, if fitted, the packing washer, over the seal so that they are positioned between the seal and press-button support in readiness for assembly to the car door.

Replacing vertical sliding glass panel

First remove the unserviceable glass in the following manner :-

1. Open the door and remove the interior trimming panel as described on page 87.
2. Remove the five "Parker-Kalon" screws and detach the wooden guide rail from the door centre rail.
3. Remove the screws and detach the two rubber stops from the lower ends of the glass run channels in the window frame.
4. Refit the window winding handle temporarily and wind down the window until the two lifting arms run off their guides.

5. Lift up the front end of the glass, then withdraw the panel carefully.

Before fitting the replacement glass, check the condition of the felt or "Furflex" channel section fitted to the window frame. If the section is worn or frayed, a replacement should be obtained and fitted. The "Furflex" section is no longer fitted in current production cars and replacement felt sections only can be supplied.

Pull away the defective section from the window frame, then press the replacement felt section into the lower end of the window frame. Continue to fit the felt around the frame, making a mitre cut in the section to obtain a snug fit at the top rear corner of the frame.

Make sure that the felt lies evenly in the frame before proceeding to fit the replacement glass in the following manner.

1. Fit the replacement glass, rear end first, into the window frame, make sure that the panel locates squarely in the felt channel section, then lower it carefully into the carrier.
2. Wind the panel upwards until the lifting arms engage their guides, then continue winding until the window is approximately half-closed.
3. Refit the two rubber stops.
4. Refit the wooden guide rail, securing it with the five screws.
5. Wind the window to the fully closed position and check that the glass fits squarely into the top run of the frame. If necessary adjust the position of the mechanism as described under "Adjusting vertical sliding window" on page 85 to satisfy this requirement.
6. Detach the winding handle, then refit the interior trimming panel (see page 87), followed by the components that were detached to effect removal of the panel.

Replacing door assister
spring assembly components

To obtain access to a defective assister spring assembly, the anemostat panel must first be removed; this is described in items 1 and 2 on page 108.

To renew a weak or broken door retaining spring, proceed as follows :-

1. First provide access to the assembly, then close the door partially and remove the door retaining nut, its lock-nut the fibre washer and the hinge pin locking plate (see "Removing and refitting a door", items 3, 4 and 5).
2. Remove the $\frac{1}{4}$ in. B.S.F. bolt, shake-proof washer and nut securing the assister spring housing to the top of the hinge box, and the $\frac{5}{16}$ in. B.S.F. bolt, shim washer, shake-proof washer and nut securing the housing to the front of the box; detach the housing complete with the door retaining spring.
3. Hold the unit in a vice and remove the four rivets securing the spring to the housing by drilling the rivet heads with a $\frac{1}{8}$ in. diameter drill, then cutting off the heads with a sharp chisel; detach and discard the spring.
4. Locate the replacement spring in position and secure with four $\frac{1}{8}$ in. dia. mild steel, round-head rivets $\frac{3}{8}$ in. long.
5. Re-assemble the housing and spring unit over the eyebolt and assister spring and secure to the front of the hinge box with the $\frac{5}{16}$ in. B.S.F. bolt, shim washer, shake-proof washer and nut, interposing the shim washer between the housing and hinge box mating faces.
6. Refit the hinge pin locking plate, securing it with the $\frac{1}{4}$ in. B.S.F. set-bolt and shake-proof washer, then fit the $\frac{1}{4}$ in. B.S.F. bolt, shake-proof washer and nut to secure the spring housing to the top of the hinge box.
7. Finally, fit a new fibre stop washer over the protruding end of the eyebolt, screw on the door retaining nut, followed by its lock-nut, then adjust the retaining nut to give the desired degree of door opening before tightening the lock-nut (see "Adjusting door stop", page 83).
8. Pack the assister spring assembly with grease before refitting the anemostat panel and front seat.

To fit a replacement door assister spring, proceed as follows :-

1. First provide access to the assembly, then remove the spring housing as described in the foregoing items 1 and 2.
2. Remove and discard the unserviceable spring. Locate the replacement spring over the end of the eyebolt, then carry out all the operations detailed in the foregoing items 5, 6, 7, and 8.

Replacing door buffers

It should be noted that where the rubber buffers are worn badly on the bottom face, indicating that the door has dropped on the hinges, the fitting of replacement buffer units will not in itself effect a cure. Reference should, therefore, be made to page 98 where the procedure for rectifying a dropped door is described.

To renew a buffer unit which has perished or cracked, proceed as follows :-

1. Open the door, remove the two "Parker-Kalon" screws and retaining plate from the rubber buffer, and detach the buffer and back plate.
2. Remove the three "Phillips" screws securing the buffer plate, and detach the plate from its recess in the rear door post.
3. Fit the replacement components in position and secure them with their appropriate screws.
4. Close and open the door to check the lock operation and the efficiency of the buffer units.

Replacing door hinge bushes

Two "Oilite" bushes are fitted to each hinge, those of the upper hinge being flanged. It is recommended that a new hinge pin is also fitted when renewing the hinge bushes.

Fit replacement bushes in the following manner :-

1. Remove the door as described on page 85, and transfer it to a bench.
2. Support the hinge from which the bushes are to be removed. Insert a soft metal drift through the bore of the upper bush, locate it against the inside face of the lower bush and tap out the lower bush.
3. Reverse the door again, support the hinge and drift out the upper bush.
4. Apply a smear of grease to the outside diameters of the replacement bushes, and tap them into position.
5. Lubricate the bush bores with clean engine oil, then re-assemble the door to the car as described on page 86.

Replacing door lock operating cable

Replacement cable assemblies made up ready for installation can be supplied, but since it may be more expedient for an overseas agent to make up an assembly from "Bowden" cable obtained locally, details of the procedure to be adopted are given herewith. It is assumed that both the cable and conduit are to be renewed, and the following "Bowden" items will be required :-

1. "Bowden" cable - type P19/1 (0.062in. dia.).
2. "Bowden" conduit - type B.1.H. (0.100in. internal dia.).
3. Ferrules for conduit - 2 off.
4. "Bowden" trunnion type nipple - $\frac{5}{8}$ in. dia., drilled diametrically.
5. "Bowden" trunnion type nipple - $\frac{3}{16}$ in. dia., drilled longitudinally.

Proceed as follows :-

1. Open the door and remove the interior trimming panel, as described on page 87.

2. Remove the lock attachment plate as described under "Removing and refitting door lock mechanism", items 2, 3, 4, 5 and 6.
3. Unless already broken, cut the cable and withdraw it from the conduit, then detach and retain the cable adjuster bolt and lock-nuts.
4. Withdraw the conduit from the three clips securing it to the lock attachment plate.
5. Cut the replacement conduit to a length of 30.875in., fit the two ferrules and position the conduit in the attachment plate clips.
6. Solder the $\frac{5}{8}$ in. dia. trunion nipple to one end of the replacement cable, then tin and cut the cable to a length of 38.25in.
7. Lubricate the cable with graphited grease, making sure that no lubricant contacts the tinned end of the cable.
8. Fit the cable adjuster to its full extent to the housing on the locking lever, then thread the cable through the conduit from the rear end and pass it through the bore of the adjuster.
9. Make sure that the tinned end of the cable is perfectly clean, then solder the $\frac{3}{16}$ in. dia. trunion nipple to the cable.
10. Refit the lock attachment panel to the door as described in items 4, 5 and 6 of the refitting process of "Removing and refitting door lock mechanism".
11. Adjust the cable tension as described under "Adjusting door lock" on page 84, then refit the interior trimming panel as described on page 87.

Correcting a dropped door

In instances where this has occurred, first examine the door lock bolt, the striker plate, and the two door buffer units for wear. If severe wear has occurred, the various components should be renewed as described on pages 87 to 93. In addition, open the door and lift and lower the "toe" of the door to check the hinges for wear; renew the hinge pins and bushes if wear has occurred, then check whether this action has returned the door to its correct position.

Should the defect persist after renewal of the foregoing components or should the hinge bushes and pins not be worn, adopt the procedure described subsequently, since it may reasonably be assumed that some distortion of the box-section hinges has occurred.

Due care and discretion must be exercised when performing the following operations.

1. Open the door and remove the interior trimming panel (see page 85).
2. Remove the $\frac{1}{4}$ in. B.S.F. screw, washer and nut securing the diagonal bracing strip to the door framework.
3. Locate a jack under the rear end of the door and, interposing suitable soft packing, jack up the door carefully.
4. Release the jack and close the door, checking that the lock functions efficiently and that the top edge of the door outer panel blends with the adjacent rear body panel. If necessary, repeat the jacking operation until the door is returned to its correct position.
5. Check the position of the bolt hole in the bracing strip with the corresponding hole in the frame. It will usually be found that the holes are now out of alignment. If this is so, drill a $\frac{1}{4}$ in. hole through the strip and frame, then refit the screw, washer and nut.
6. Refit the trimming panel, followed by the fittings that were detached to effect removal of the panel.

QUARTER LIGHTS (TYPE 401)

Description

Two types of hinged quarter light may be encountered. The first type comprises a $\frac{5}{32}$ in. thick "Triplex" toughened plate glass panel, mounted in an extruded light-alloy frame. Two hinge plates are bolted to the frame front pillar, their pivot pins engaging drillings in the upper and lower front corners

of the quarter light aperture. The second type of quarter light consists of a glass panel of similar material and contour to the first type, mounted in a chromium-plated frame. The frame front pillar is extruded and engages a hinge plate secured to the front face of the quarter light aperture. A sectioned view of the hinge is shown in Fig. 43.

Replacing quarter light glass (1st. type)

To fit a replacement glass panel, first remove and dismantle the quarter light in the following manner :-

1. Operate the toggle catch and open the quarter light.
2. Remove the three screws securing the toggle bracket to the inside edge of the quarter light aperture and open the light as far as possible.
3. Support the assembly and remove the eight countersunk screws securing the top and bottom hinge plates and the frame front pillar to the frame.
4. Detach the panel from the hinges and withdraw the hinges from the aperture, taking care not to lose the bearing washers fitted to the hinge pins.
5. Detach the frame front pillar, then jar the edge of the frame on the bench to dislodge the glass and tap the unserviceable panel from the frame with a rubber mallet.
6. Remove and discard the rubber glazing strip fitted to the frame and front pillar.

While the quarter light is removed, examine the rubber seal fitted under the finisher; if it is perished or cracked, fit a replacement seal as described on page 102.

Now prepare and fit the replacement glass as follows :-

1. Clean thoroughly the glazing strip location of the frame, then fit new glazing strip, securing it with "Bostik" adhesive.

2. Tap the replacement glass in position, taking care not to distort or dislodge the glazing strip.
3. Refit the front pillar to the frame.
4. Apply a smear of grease to the hinge pins, make sure that the bearing washers are in position, then assemble the hinges to their locations in the quarter light aperture and offer the light to the hinges. Secure the light to the hinges with the eight screws.
5. Close the panel and secure the toggle attachment bracket to the inside edge of the aperture with the three countersunk screws.

Replacing quarter light glass (2nd type)

To fit a replacement glass panel, first remove and dismantle the quarter light in the following manner :-

1. Operate the toggle catch to open the quarter light, then remove the three screws securing the toggle bracket to the inside edge of the quarter light aperture.
2. Open the quarter light as far as possible, support the assembly and remove the four "Phillips" screws securing the panel hinge to the front face of the quarter light aperture; detach the quarter light.
3. Slide the hinge off the frame front pillar, then remove the two countersunk-head screws from both the top and bottom corners of the frame and detach the front pillar.
4. Jar the edge of the frame on the bench to dislodge the glass, then tap out the panel with a rubber mallet.
5. Remove and discard all rubber glazing strip.

While the quarter light is removed, check the condition of the moulded rubber seal fitted under the finisher; if it is perished or cracked renew the seal as described on page 102.

Now prepare and fit the replacement glass as follows :-

1. Clean thoroughly the glazing strip locations in the frame, then fit replacement strip, securing it with "Bostik" adhesive.
2. Tap the replacement glass into position, taking care not to distort or displace the glazing strip, then refit the front pillar and secure with the four countersunk-head screws.
3. Apply a smear of grease to the hinge portions of the front pillar, and slide the hinge plate into position.
4. Offer the quarter light to its aperture and secure the hinge plate with the four "Phillips" screws.
5. Close the quarter light and secure the toggle catch bracket to the inner edge of the light aperture with the three screws.

Replacing quarter light seal

To renew the seal, proceed as follows :-

1. Check the type of quarter light installed and remove it as described under "Replacing quarter light glass".
2. Remove the five "Phillips" screws and detach the quarter light finisher, then pull away the unserviceable sealing strip.
3. Clean the strip location thoroughly, install a length of replacement strip, secure it with "Bostik" adhesive, then refit the finisher.
4. Refit the quarter light as described under "Replacing quarter light glass".

REAR WINDOW AND BLIND (TYPE 401)

Description

The fixed rear window is of 3/16in. thick toughened glass, curved laterally to conform with the contour of the body skin portion. The glass is held in position by a wooden fillet fitted to the interior of the window aperture, and a seal is formed between the rim of the glass and the body skin by glazing compound. A light-alloy finisher is fitted over the wooden fillet and conceals the tacking of the head lining.

The rear blind is carried on a spring-loaded roller mounted on the underside of the squab shelf, the blind passing upwards through a slot in the shelf. Two 26 S.W.G. cheese wire cables operate the blind, the cables passing upwards from the blind through eyelets in the head lining, where they are conveyed forward through two coiled wire conduits secured above the head lining. The two wires converge through an eyelet in the lining above the front seats, where they connect to an erinoid ring. A knob fitted immediately below the loudspeaker provides an attachment for the ring to retain the blind in the fully-extended position.

Replacing rear window

To replace a damaged rear window proceed as follows :-

1. Remove the ten "Phillips" screws and detach the finisher.
2. Extract the tacks holding the head lining to the wood fillet, then pull the lining material away carefully from the rear window aperture.
3. Remove the wood-screws securing the fillet in position and detach the fillet.
4. Remove the damaged glass.
5. Remove all glazing compound from around the window aperture.

Now fit the replacement glass as follows :-

1. Apply "Mastikon" or similar glazing compound freely around the window aperture, then press the replacement glass into position.
2. Position the wood fillet and secure with the wood-screws, then re-position the head lining material over the fillet and secure with the tacks.
3. Refit the finisher.
4. Trim away all surplus glazing compound from around the aperture, making sure that an efficient seal is formed between the glass and the body skin.

Replacing blind operating wire

In the following paragraph it is assumed that the wire has broken within the conduit. Proceed as follows :-

1. Pull the broken wire rearwards out of the conduit, removing the erinoid ring as it is released, then thread the unserviceable wire out of the screw-eyes in the blind rail.
2. Cut a 12ft. 3in. length of 26 S.W.G. cheese wire and fit the erinoid ring on to it.
3. Press up the head lining immediately to the rear of the eyelet over the front seats to locate the ends of the conduits, then thread one end of the wire through the eyelet and into one of the conduits.
4. Feed the wire carefully through the conduit (movement can be heard as the wire is inserted), then press up the head lining around the corresponding eyelet at the rear to locate the end of the conduit and check the position of the wire as it emerges from the conduit.
5. Insert a hooked piece of wire through the eyelet, engage the end of the cheese wire and pull it down smartly through the eyelet.
6. Repeat items 3, 4 and 5 to fit the other end of the cheese wire into the second conduit.
7. Level the ends of the wire and pull it rearwards as far as possible, noting that the erinoid ring fits snugly against the front eyelet.
8. Align the ends of the wire with the screw-eyes in the blind rail, then form a loop neatly in the ends of the wire level with the screw-eyes.
9. Apply a blob of solder to each loop, cut off any excess wire, then spring open the screw-eyes slightly and insert the wire; nip the screw-eyes, making sure that the wire is held captive in the eyes.
10. Check the blind for satisfactory operation.

SEATS AND UPHOLSTERY

Description

Separate front seats are provided for the driver and passenger, and a full width, bench type rear seat is fitted. All seats are quickly detachable, including the rear seat squab.

The two front seats are similar in construction, consisting of a wood and metal framework with deep section foamed latex cushion pads incorporated in both the seat and back-rest. Each seat is upholstered in grey-beige upholstery leather with brown carpet trimming around the seat base and brown moquette backings to the back-rests. The back-rests are adjustable for rake by means of eccentrically-mounted, four-lobed cams which are fitted to both sides of the seat, see Fig.44.

Each front seat is mounted in channel section runners, and is anchored at the inside front edge by a spring-loaded clip to an adjuster catch unit. The catch engages a slotted plate in the inboard runner and provides fore-and-aft seat adjustment.

The bench type rear seat embodies a coiled wire spring unit with wadding overlay and is upholstered in the same style as the front seats. A rear seat squab of similar construction to the seat is fitted and, in common with the seat, is quickly removable. On type 401 cars, the squab is fitted with a central folding arm-rest which may be folded back into a recess to provide rear seat accommodation for three persons. The recess also houses the operating knob of the boot door release mechanism, a unit which is described fully on page 123.

Padded and upholstered corner arm-rests are fitted both to type 401 and 402 cars, those of the 402 being of the quickly-detachable cushion type to provide access to the hood stowage compartments. The left-hand arm-rest of the type 401 saloon incorporates the push-button release unit of the petrol filler door (described on page 119). On the type 402 car however, this control is fitted to the left-hand side of the seat squab, while the boot door release knob is accommodated in a corresponding position on the right-hand side of the squab.

A large squab shelf is installed in the type 401 saloon and mounts the rear blind on its underside. On cars of later production, an extension loudspeaker may also be fitted to the underside of the shelf. The shelf may readily be removed, if necessary, to obtain access to a defective rear blind or loudspeaker.

Four detachable carpets are fitted, i.e. the left-hand, centre and right-hand front carpets, and the single, full-width rear carpet; press-stud fasteners secure the carpets in position. An addition, two small carpet panels are secured to No. 3 chassis cross-member with "Bostik" adhesive, and carpet strips are fitted to the chassis side extensions and secured in a similar manner. Apertures are cut in these latter panels to provide access to the two jacking point covers. A small carpet-cloth bonnet is fitted loosely over the hand brake coupling.

Two carpet-covered panels are fitted to the left and right-hand sides of the scuttle, each panel mounting an anemostat which serves as an air outlet to the interior of the car from the air intake ducts contained within the front wings.

Note :- The anemostats are a standard fitting; their presence must not be taken as an indication that car heaters are installed.

"Lionide" upholstery leather is used for the head-lining of the type 401 car. The lining comprises six panels, which are sewn together with calico strip interposed at the joints, this being sewn finally to the hessian binding of the tubular roof members, thereby retaining the lining in position. At the front, sides and rear, the head lining is secured with tacks and rubber upholstery solution around the windscreen, quarter light and rear window aperture frames, final trimming at these points being effected by detachable, strip metal finishers.

Removing and refitting front seats

The method of removing either of the front seats is identical.

1. Fold the back-rest forward.
2. Pull up the spring-loaded anchorage catch on the inboard side of the seat to disengage it from the adjusting catch, then slide the seat rearwards out of the runners and lift it from the car.

To refit the seat :-

1. Fold the back-rest forward and engage the guides at the base of the seat with the runners on the floor of the car.
2. Slide the seat forward until the anchorage catch springs over the lobe of the adjuster catch.
3. Position the back-rest.

Removing and refitting rear seat

1. Lift up the seat at the front, then pull forward and remove the seat from the car.
2. Lift up the squab to disengage the two anchorages from the brackets at the front of the shelf, and lift out the squab.

Reverse the foregoing sequence when refitting the seat and squab.

Removing and refitting squab shelf

To remove the shelf, proceed as follows :-

1. Remove the rear seat and squab as described previously.
2. Carefully ease open the two screw-eyes fitted to the ends of the rear blind rail and disconnect the operating wires from the eyes.
3. If an extension loudspeaker is fitted to the underside of the shelf, pull away carefully the protective covering to expose the lead connections, then un-solder the connections and label the two leads to ensure their correct re-assembly.
4. Remove the screws securing the shelf to the body structure cross-member at locations immediately to the rear of the squab anchorages, then lift up the front of the shelf and withdraw it from the car.

To refit the squab shelf, reverse the foregoing sequence, taking care to re-solder the extension loudspeaker leads to their correct terminals and making sure that the rear blind screw-eyes are closed completely after re-connecting the operating wires.

Removing and refitting anemostat panels

The panels must be removed to obtain access to the door assister spring units, and to the heater radiators and de-mist blower if fitted. Proceed as follows :-

1. Remove the three screws securing the rear edge of the panel to the door pillar, then lift up the front corner of the floor carpet to expose the small attachment bracket securing the lower forward corner of the panel to the toeboard extension.
2. Remove the two screws securing the bracket to the toeboard extension and withdraw the panel.

Reverse the foregoing sequence when refitting the panel.

Removing and refitting floorboards and tunnels

The following paragraph describes the operations necessary to provide access to the gearbox and propeller shaft from within the car.

1. Remove the front seats in the manner described on page 107.
2. Take up the front carpets and remove the bonnet from the hand brake linkage.
3. By removing the appropriate mushroom-head screws, detach and remove the undermentioned components in the order in which they are given :-
 - (a) Clutch inspection cover.
 - (b) Front tunnel.
 - (c) Rear tunnel.
 - (d) Left and right-hand floorboards.
4. If it is required to remove the toeboard, first disconnect the accelerator pedal linkage and swing the pedal upwards, then unscrew the clutch and brake lever pads from their levers and detach the dip switch before removing the toeboard securing screws.
5. Access may be obtained to the propeller shaft rear coupling by removing the rear seat and squab, as described on page 107, and removing the mushroom-head screws securing the inspection cover at the base of the squab bulkhead.

Reverse the foregoing procedure when refitting the floorboards and tunnels.

Removing and refitting arm-rests (type 401)

The following paragraph describes the operations required to remove the arm-rests, thereby providing access to the body skin to permit repairs to be effected. It should be noted that the left-hand arm-rest embodies the push-button release unit of the spring-loaded petrol filler door, and the control must first be dis-

connected before removing the arm-rest. Removal of this arm-rest is described herewith; omit those items referring to the push-button release when removing the right-hand arm-rest.

1. Operate the push-button to open the petrol filler door, then working within the filler box, slacken the lock-nut and withdraw the operating cable from the clamp screw, see Fig.48.

2. Remove the rear seat and squab, see page 107.

3. Remove the quarter light finisher and seal, see "Replacinq quarter light seal", then remove the two "Phillips" screws and detach the rear door pillar trimming panel.

4. Raise the trimming material away from the sill of the quarter light aperture and extract the tacks securing the rear edge of the material to the wheel arch panel. This will provide access to the three small panel attachment brackets.

5. Remove the screws securing the brackets to the quarter light aperture and the wheel arch panel; remove also the securing screw from the fourth bracket at the base of the arm-rest panel.

6. Lift out the arm-rest, complete with the petrol filler operating cable.

To refit the arm-rest, proceed as follows :-

1. Offer the arm-rest in position, passing the cable assembly over the wheel arch.

2. Secure the arm-rest in position by refitting the screws to the four attachment brackets.

3. Re-position and secure the arm-rest panel trimming material around the quarter light aperture and wheel arch.

4. Refit the rear door pillar trimming panel and the quarter light finisher and rubber seal.

5. Working within the boot, pass the operating cable through the bore of the "Bowden" cable adjuster on the front face of the petrol filler box, making sure that the outer casing seats in the cup of the adjuster.

6. Connect the cable to the filler door catch and adjust it as described on page 121.
7. Refit the rear seat and squab.

HEATING AND VENTILATING SYSTEM

Description

The ventilation system, which is a standard fitting on all type 401 cars, comprises two metal ducts which are mounted outboard of the engine compartment side valances, and contained within the right and left-hand front wings. The duct intakes are located behind the radiator grille, and are fitted with shutters controlled by a push/pull wire and knob located on each side of the dash immediately above the bonnet release controls. Each shutter is counter-balanced to prevent loading of the mechanism due to air pressure at high speed. The rear end of each duct communicates with apertures in the scuttle, the air outlets to the saloon compartment being through circular diffusers or anemostats mounted in the upholstered panels on each side of the scuttle.

The heating system is an optional fitting and, when installed, is contained within the ventilating system. A general view of the combined heating and ventilating system is given in Fig.45.

The heating system comprises two heater radiators contained in the rear ends of the ventilating ducts and supplied with hot water from the cylinder head through suitable piping. Water which has circulated through the heaters is ducted back into the cooling system by piping connection between the heaters and the radiator bottom hose. Each heater is fitted with a drain tap and rubber drain hose. An "ON-OFF" tap is incorporated in the supply pipe to the heaters, the tap being linked to a control knob mounted on a bracket secured to the underside of the right-hand tool tray.

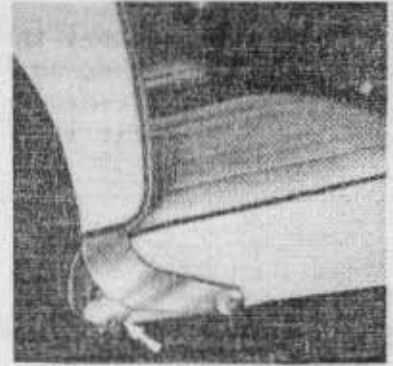
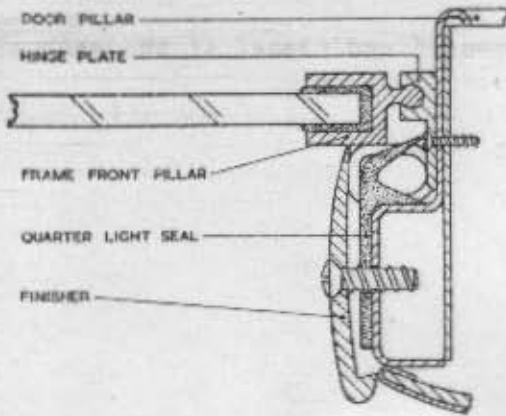


Fig.43. Sectioned view of Quarter Light Hinge (2nd Type).

Fig.44. Back Rest Cam Adjuster.

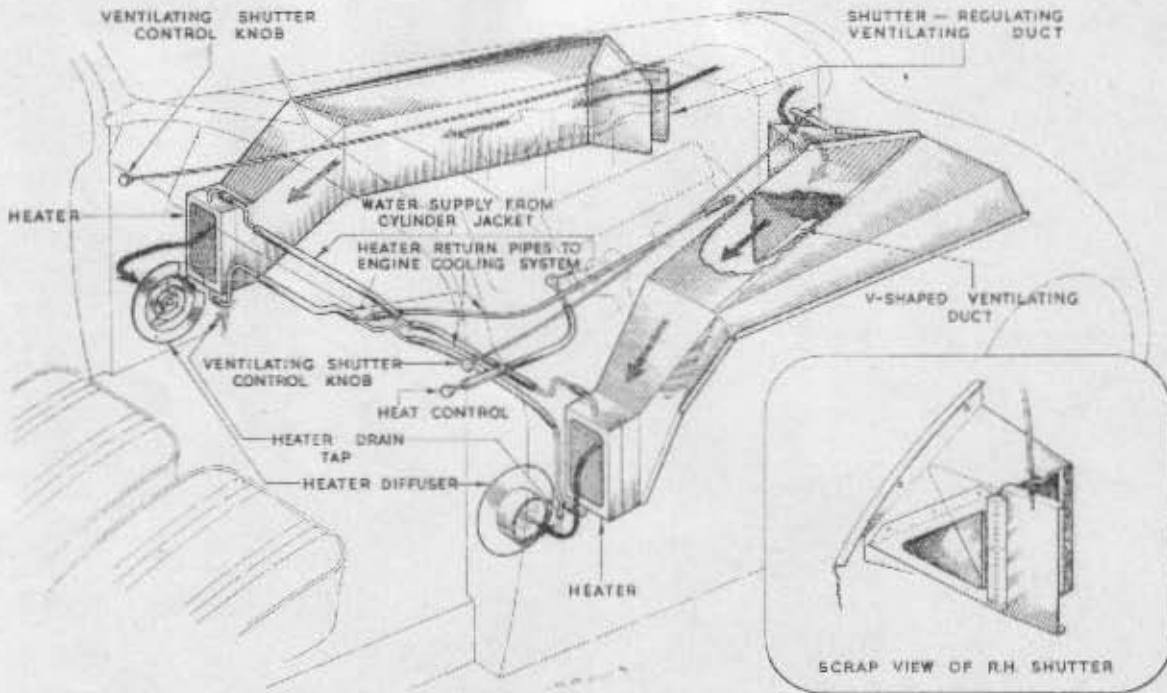


Fig.45. Heating and Ventilating System.



Fig.46. General view of Heater Water Pipes.

A modified "Smiths" de-mist fan is mounted immediately to the rear of the right-hand heater and contained behind the anemostat panel. The fan delivers warm air through a coupling pipe into a duct fitted behind the fascia, the air being emitted through two louvres in the fascia peak on to the windscreen panels. Fan speed is governed by a rheostat contained in the instrument panel, the rheostat control knob "D" being located on the left-hand side of the fascia above the r.p.m. indicator. With the knob turned "ON" the fan runs at full speed, and further rotation of the knob decreases fan speed.

- Note 1. Although the heating system may not be installed in the car, the de-mist ducting behind the fascia is fitted as standard.
- Note 2. To obtain efficient functioning of the heating system, it is essential to open the quarter lights and air intake shutters to maintain a flow of air through the saloon compartment.

Installing heating system

The heating system can readily be installed in the type 401 saloon, complete sets being obtainable from the Car Division of the Bristol Aeroplane Company Limited. When ordering a set, please state whether the car is left or right-hand drive, since there are slight alterations in the piping to suit either installation. Proceed as follows :-

1. Drain the cooling system, see Section 2, and remove and discard the radiator bottom hose.
2. Remove the front seats, see page 107, and the anemostat panels, see page 108. It is also advisable to take up the front carpets.
3. Disconnect and remove the battery.
4. Check that the two heater radiators are clean and unobstructed by applying a blast of clean, dry, compressed air through one of the stub pipes in each radiator.

5. Assemble rubber hose connections to the inlet and outlet stub pipes of each heater, then slide the heaters into position in the apertures on each side of the scuttle.
6. Fit the retaining strips to the top and bottom of each aperture, securing them with 2 B.A. bolts, shake-proof washers and nuts. Now prepare and fit the de-mist fan unit in the following manner :-
7. Wrap the 28 S.W.G. sheet steel fan extension around the intake flange and secure with the Jubilee clip.
8. Remove the $\frac{1}{4}$ in. B.S.F. set-bolt from the rear face of the fan housing and assemble the bracket N.707130 to the housing, securing it with the set-bolt.
9. Secure the support bracket N.707103-2 to the attachment plate on the side of the unit with two 2 B.A. bolts, shake-proof washers and nuts.
10. Assemble the coupling pipe temporarily to the de-mist duct inlet, using the longer of the two large hose connections, then fit the shorter hose connection to the lower end of the pipe.
11. Offer the fan unit into position and connect it temporarily to the coupling pipe.
12. Make sure that $\frac{1}{16}$ in. to $\frac{1}{8}$ in. clearance exists between the front of the fan extension and the heater, and that there is clearance between the fan housing and the side panelling of the car.
13. Mark the position of the three 2 B.A. bracket retaining bolt holes in the bulkhead, and the two $\frac{1}{4}$ in. holes for the support bracket holes in the scuttle rear support.
14. Remove the de-mist fan unit and the coupling pipe, then drill the three 2 B.A. holes in the bulkhead, and the two $\frac{1}{4}$ in. holes in the rear support, drilling through only the front wall of the support at the inboard bolt location. Then assemble the various feed and return pipes as follows :-
15. Remove the blanking plate from the centre of the bulkhead and enlarge the hole to $\frac{3}{4}$ in. diameter to accommodate the water return pipe unit.
16. Position the pipe unit, arranging it so that the curve of the lower pipe fits over the steering column, then mark and drill the three securing bolt holes, and secure the unit in position with three 2 B.A. bolts, shake-proof washers and nuts.

17. Assemble the short rigid pipe N.707102-10 to the hose joint already fitted to the top stub pipe of the right-hand heater with a Jubilee clip, then assemble the heat control cock and bracket unit to the pipe with a further rubber hose joint and Jubilee clips.
18. Locate the control cock bracket against the underside of the right-hand tool tray, positioning the bracket flush with the rear edge of the tray and one inch in from the right-hand corner.
19. Mark and drill the position of the three securing bolt holes, then, with the control cock still in position, mark and cut a 1in. diameter hole in the bulkhead directly in line with the front connection of the cock; remove the cock unit.
20. Cut an 18in. length from the 5/8in. inside-diameter rubber hose supplied in the set, and secure the hose to the control cock front connection with a Jubilee clip.
21. Offer the control cock unit into position, inserting the rubber hose through the hole in the bulkhead. Connect the cock to the short rigid pipe and tighten the Jubilee clips, then secure the mounting bracket to the underside of the tool tray with three 3/4in. long 2 B.A. bolts, shake-proof washers and nuts, arranging the bolts with their heads within the tray.
22. Assemble the two rigid pipes which embody drain taps to the hose connections already fitted to the bottom stub pipe of each heater; secure the pipes with Jubilee clips. Assemble the remaining short rigid pipe N.707102-9 to the hose connection fitted to the top stub pipe of the left-hand heater and secure in a similar manner.
23. Now cut four suitable lengths of 5/8in. inside-diameter rubber hose and assemble these hoses as follows :-
 - (a) Heat control tap unit to return pipe unit top pipe.
 - (b) Return pipe unit top pipe to left-hand heater top pipe.
 - (c) Left-hand heater bottom pipe to return pipe unit bottom pipe.
 - (d) Return pipe unit bottom pipe to right-hand heater bottom pipe.

Secure all connections with Jubilee clips.

24. Support pipes (a) and (d) with the double hose clip, and secure the clip to the underside of the right-hand tool tray with a 2 B.A. bolt, shake-proof washer and nut. Support pipes (b) and (c) with "Lucas" 1 in. dia. cleats secured in a similar manner to the underside of the battery tray, the left-hand tool tray, and the bulkhead.
25. Drill a 5/16in. dia. hole in the chassis side extension immediately under each heater drain tap. Cut the 1/2in. inside-diameter rubber hose, supplied in the set, into two 6in. lengths, then apply "Bostik" adhesive to the two tap connections and fit the hoses, inserting their lower ends through the holes drilled previously. Bind the two connections lightly with wire.
26. Turn the spindle of the control cock clockwise as far as possible into the "OFF" position, then fit the control knob to the spindle and position the knob with the word "HEAT" horizontal. Drill and tap the shank of the knob and the spindle 4 B.A., then fit and tighten the small "Allen" screw.
27. Fit the coupling pipe to the de-mist duct inlet with the large diameter hose connection, and secure with two large Jubilee clips.
28. Position the de-mist fan unit and secure its two mounting brackets with the three 2 B.A. bolts, shake-proof washers and nuts, and the two 1/2in. B.S.F. bolts, shake-proof washers and nuts.
29. Un-tape the rheostat lead from the structure member adjacent to the fan (the lead is a standard fitting on all type 401 cars). Bare the ends of this lead and one of the two leads attached to the fan, and slip a "Lucas" insulating sleeve over the rheostat lead. Join the two leads and slide the sleeve over the joint.
30. Fit a "Ross-Courtney" terminal tag to the remaining de-mist fan lead.
31. Remove the upper of the two 2 B.A. bolts, washers and nuts securing the fan bracket to the inboard support bracket, then fit a "Lucas" 1/2in. dia. cleat to the adjacent heater bottom pipe. Secure the pipe to the fan bracket with the 2 B.A. bolt, shake-proof washer and nut, fitting the terminal tag of the fan lead under the head of the bolt, thus "earthing" the fan, see Fig.47.

This completes the installation of the heater system within the saloon compartment, but first make sure that all Jubilee clips are tight before continuing in the following manner :-

32. Apply "Bostik B" adhesive to the convex flange of the pipe connector N.631871 and insert the connector into the replacement radiator hose, locating it in the hole cut in the hose wall. Make sure that the flange lies evenly against the wall of the hose, then apply "Bostik" to the exterior of the hose around the protruding connection and to the concave face of the special washer N.631911. Fit the washer, making sure that it seats squarely against the hose, then screw on and tighten the lock-nut.
33. Fit the hose between the radiator and water pump.
34. Cut two $3\frac{1}{2}$ in. lengths of $5/8$ in. inside-diameter rubber hose, fit them to the ends of the rigid pipe N.707102-1 and secure with Jubilee clips.
35. Fit the pipe unit between the connector on the radiator bottom hose and the stub of the return pipe unit protruding through the centre of the bulkhead. Secure the two connections with Jubilee clips.
36. Remove the large banjo blanking bolt from the rear right-hand side of the cylinder head, then fit the banjo pipe unit N.707102-4, securing it with the banjo bolt and interposing fibre washers each side of the banjo.
37. Connect the rubber hose protruding through the right-hand side of the bulkhead to the banjo pipe and secure lightly with a Jubilee clip.
38. Refit and connect the battery.
39. Turn the heat control cock to the "ON" position and make sure that the drain taps of the two heaters, the cylinder block and the radiator are turned "OFF".
40. Partially disconnect the rubber hose from the banjo on the rear of the cylinder head, then replenish the cooling system until all air has been expelled through the partially-disconnected hose; re-connect and secure the hose to the banjo and fill the radiator to the correct level.
41. Check the entire system for freedom from leaks at the hose joints.
42. Refit the anemostat panels, the front carpets (if removed previously) and the front seats.
43. Take the car on the road and check the heating system and controls for efficient functioning, noting that the quarter lights and the air intake shutters must be opened to permit circulation of air through the heaters.

Removing and refitting air intake duct

If, for any reason, it is desired to remove a duct, adopt the following procedure :-

1. Jack up the front of the car.
2. Remove the appropriate front wheel.
3. Open the bonnet on the side at which the duct is to be removed.
4. Working on the inside of the wing, remove the front stone guard by removing the two $\frac{1}{2}$ in. B.S.F. set-bolts from the centre of the guard and the three 2 B.A. bolts, washers, and nuts from the top edge of the guard; detach the guard.

Note :- The three 2 B.A. bolts also secure the top of the air intake duct and the shutter box to the radiator side diaphragm.

5. Remove the two remaining 2 B.A. set-bolts securing the front end of the duct in position, then support the duct and ease the felt away from its rear end.
6. Lower the front of the duct, lift it forward to disengage its rear end from the aperture in the scuttle, and remove the duct from beneath the wing.

Note :- The shutter box will remain in position, being retained by the small attachment bracket secured to the underside of the front bonnet hinge box.

Reverse the foregoing procedure to refit the duct, taking care to re-position the felt correctly around the rear end of the duct to ensure efficient sealing.

PETROL FILLER UNIT

Description

The filler unit consists of a box built into the left-hand rear wing and containing the filler neck, to the underside of which is connected the petrol filler hose. Two further connections are provided in the base of the box, the front connection communicating with the petrol tank vent pipe, while the connection at the rear provides a drain for overflow and spillage from the filler and vent pipes.

A spring-loaded lid is fitted to the filler box and is held closed by a spring catch which is released through a "Bowden" cable unit operated remotely by a plunger assembly mounted in the left-hand arm-rest of type 401 cars, or on the left-hand side of the rear seat squab in type 402 cars. The door lock mechanism as installed in type 401 cars is illustrated in Fig.48. Operation of the mechanism is described herewith and should be read in conjunction with the diagrammatic illustration in Fig.49.

Note that the cable is anchored to the plunger housing. When the plunger is depressed, it moves rearwards and has the effect of lengthening the cable casing. The load applied is immediately transmitted as an equal and opposite load to the cable, which moves forwards and pulls the filler door catch out of engagement with the door catch pin. The door then swings open under the influence of the pivot springs.

As pressure on the plunger is released, the operating lever and catch are returned to their original positions by the tension spring and catch spring respectively.

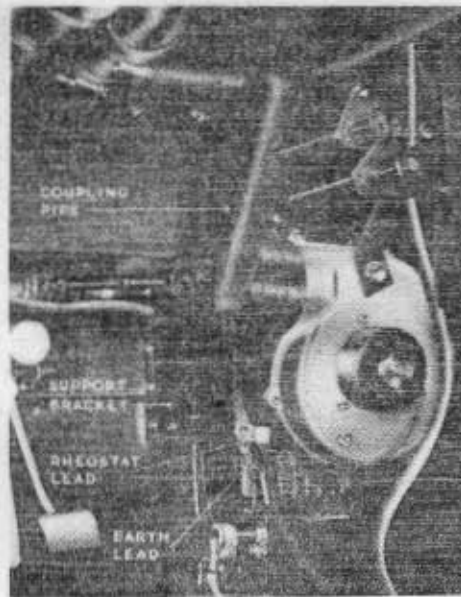


Fig.47. Heater and De-mist Fan details.

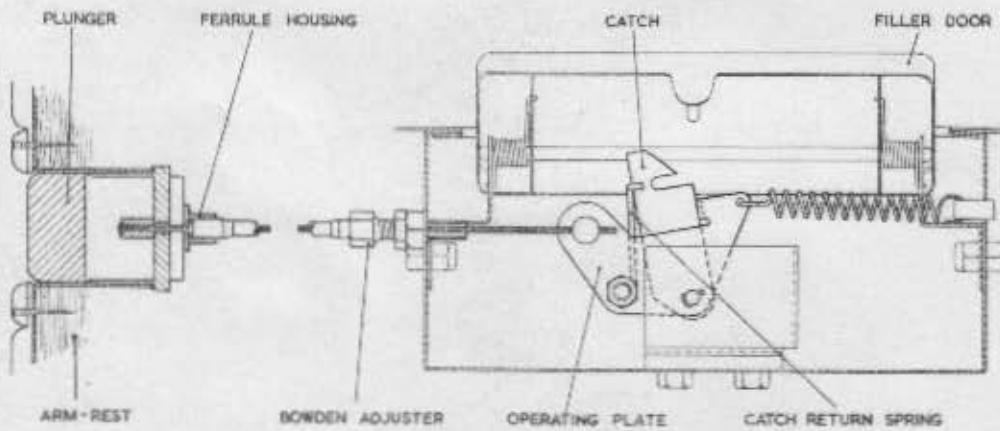


Fig.48. Petrol Filler Door Lock details.

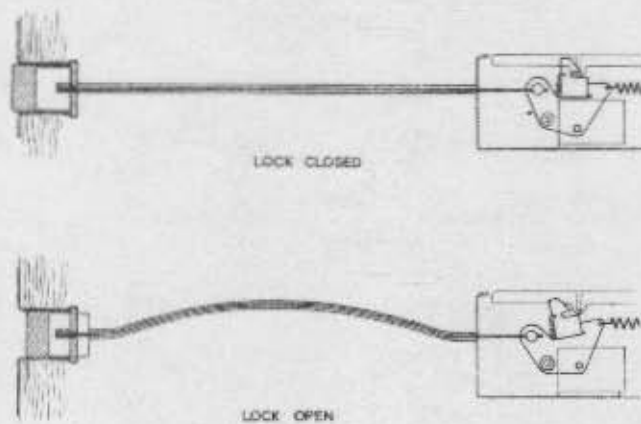


Fig.49. Diagram of Lock operation.

Maintenance

Since the end of the operating cable and the catch mechanism are continuously exposed to the degreasing action of petrol vapour and spillage, frequent attention should be given to the lubrication of these components to ensure efficient operation.

Lubricate the door hinges, its springs and the catch pivot with a few drops of engine oil and check the catch for freedom from binding. Apply a few drops of penetrating oil containing graphite to the exposed portion of the operating cable and depress the plunger several times to distribute the oil within the "Bowden" adjuster.

Adjustments

Provided that the foregoing instructions are adhered to, the door catch operating mechanism will retain its setting for long periods. If, however, the plunger has to be depressed an appreciable amount before the door is released, adopt the following procedure :-

1. Open the boot door and release the lock-nut of the "Bowden" cable adjuster fitted to the front face of the petrol filler box.
2. Screw out the adjuster until the door catch is in the vertical position, then close the filler door slowly, checking that the door catch pin rides down the inclined face of the catch and that the catch is heard to spring over the pin as the door is closed fully.
3. Now check the release mechanism by depressing the plunger; the cable is adjusted correctly if the door is released when the plunger has been depressed $\frac{1}{8}$ in. to $\frac{3}{16}$ in.
4. Re-adjust the "Bowden" adjuster until the foregoing conditions are satisfied, then tighten the adjuster lock-nut.

In instances where the door is not released after the plunger has been depressed as far as possible, or where the catch fails to return to its normal position when pressure is released, remove and dismantle the assembly as follows:-

1. If the door remains closed, open the boot, release and screw out the "Bowden" cable adjuster until the door is released; return the adjuster to its original setting.
2. Release the lock-nut of the clamp screw securing the cable to the catch operating plate and withdraw the cable.
3. (Type 401 only). Remove the left-hand arm-rest complete with operating cable (see page 109).
4. Remove the plunger escutcheon screws and detach the escutcheon from the arm-rest (type 401), or the mounting bracket at the side of the squab (type 402).
5. Withdraw the plunger and cable assembly.
6. Remove the two countersunk-head screws securing the ferrule housing to the rear end of the plunger and withdraw the plunger from its housing.
7. Pull out the cable, then separate the ferrule housing and cable casing.

Now examine the cable and casing.

If the cable is rusted badly or if any of the strands are broken, discard the cable. Discard the casing if it is frayed or cracked excessively; replacement cables and casings are obtainable from the Car Division of the Bristol Aeroplane Company Limited.

If, however the cable strands are not broken, lubricate it as described subsequently, then re-assemble the unit. Replacement cables should be fitted in an identical manner.

8. Lubricate the cable with graphited grease, rubbing the grease well into the interstices of the cable.

9. Insert the cable into the hole in the plunger housing bridge piece, then fit the plunger.
10. Thread the ferrule housing, followed by the casing, over the cable and secure the ferrule housing to the plunger with the two screws.
11. Re-assemble the plunger and cable unit to the arm-rest (type 401), or mounting bracket (type 402) and refit the escutcheon.
12. (Type 401 only). Refit the arm-rest, see page 110.
13. Working from within the boot, arrange the run of the cable over the wheel arch, then insert the cable through the bore of the "Bowden" adjuster, making sure that the casing seats in the adjuster cup.
14. Now pull the cable through into the petrol filler box as far as possible and thread it through the hole in the clamp screw of the catch operating plate.
15. With an assistant holding the end of the cable firmly, press the operating plate forward against the loading of the return spring until the catch is vertical, then tighten the clamp screw lock-nut.
16. Depress the operating plunger a few times to check the mechanism for full operation, then check the engagement of the door catch pin with the catch and finally adjust the mechanism as described in items 2, 3 and 4 of page 121.

BOOT DOOR

Description

The boot doors fitted to the type 401 and 402 cars are similar in construction and comprise a metal framework, reinforced by a tubular metal structure, with the pressed light-alloy panel clinched over the frame. Both types of door embody a cable-operated catch release mechanism, the operating knob of which is mounted in the central recess of the rear seat squab in type 401 cars and on the right-hand side of the squab in type 402 cars. On type 401 cars, the knob is concealed when the arm-rest is folded back into the stowed position.

The catch release mechanism of all type 402 cars is identical to that installed in the initial production batches of type 401 cars. A modified type of release mechanism is installed in type 401 cars of later production, together with modified door hinges.

Where the first type release mechanism is installed, the cable unit extends rearwards from the operating knob, passing through two rubber grommets in the door aperture frame and door frame respectively. The rear end of the casing seats in a cable stop welded to the centre tube of the door structure, the cable continuing rearwards to where its trunnion nipple engages a two-legged attachment bracket. From each leg of the bracket, a "Bowden" cable extends outwards towards the lower corners of the boot door, where they connect to the operating levers of mortice type locks, see Fig.50.

A small assister spring and plunger unit is bolted to the two lower corners of the door, the plungers being compressed against striker plates on the boot sill. As the locks are released, the pressure on the plungers is relieved and the door is opened sufficiently to provide a hand-hold on its underside.

On type 401 cars of later production, the front section of the cable unit extends rearwards from the operating knob in the squab to a double-ended cable stop, and from thence the rear portion of the unit extends to the door, enters a hole drilled in the central tubular member of the door structure and extends to the lower edge of the door, where the trunnion nipple of the cable connects to the catch lever of a single centrally-disposed lock, see Fig.51. The lock embodies a spring-loaded plunger assembly, similar in construction and operation to those of the bonnet catches.

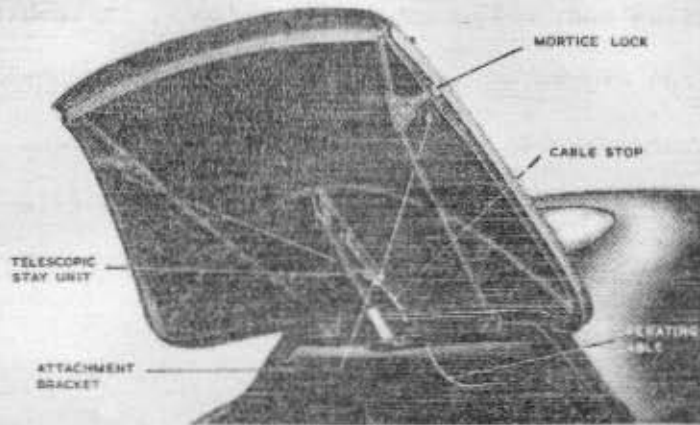


Fig. 50. Boot Door Lock Release details. (1st Type).

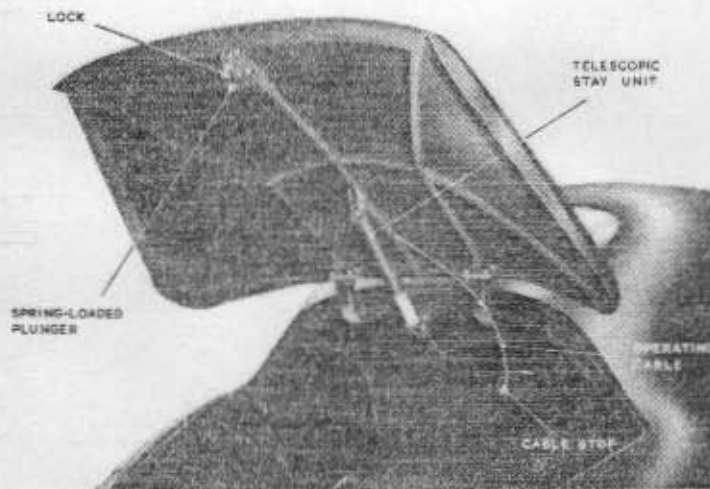


Fig. 51. Boot Door Lock Release details. (2nd Type).

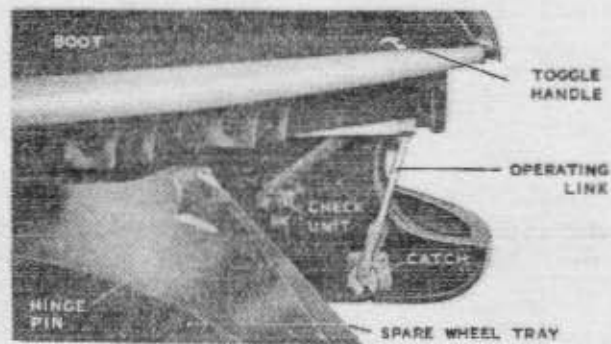


Fig. 52. Spare Wheel Tray Catch details.

All type 401 boot doors embody a telescopic stay unit containing a compression spring and adjusting rod. The design of the unit is such that the door is retained at any desired degree of opening, since the compression loading of the spring is always counter-balanced by the overhang weight of the door. The maximum degree of door opening is set by the manufacturer, the extended length of the stay measured between the centres of the two hinge pins being 13.50in. (± 0.0675 in.); this setting should not be altered.

The type 402 boot door embodies a channel section stay, recessed at its rear and supported in a catch bracket welded to the central tube of the door structure, the stay hinging at its front end in a bracket on the drain channel.

The catch bracket contains a spring-loaded plunger unit and, as the door is opened, the stay slides in the bracket until the recess in the stay snaps over the outer face of the bracket under the pressure exerted by the plunger unit. The door is then locked in the open position. When closing the boot door, press the stay against the plunger and lower the door, maintaining the pressure until the stay recess is clear of the bracket.

Removing and refitting (type 402 and early type 401)

1. Open the door and detach the operating cable nipple from the catch plate.
2. Withdraw the cable and casing from the cable stop on the door tube member.
3. (a) Type 401 only. Support the door, then extract the split pin; withdraw the hinge pin securing the telescopic stay to the bracket on the underside of the door.
(b) Type 402 only. Support the door, then extract the split pin and withdraw the hinge pin from the channel-section stay; withdraw the stay rearwards from the catch bracket.

4. Remove the three countersunk-head screws securing each door hinge to the aperture frame and lift away the door.

Reverse the foregoing sequence to refit the door.

Removing and refitting (later type 401)

1. Open the door and remove the three 2 B.A. bolts, shake-proof washers and nuts securing the lock unit between its mounting brackets; withdraw the unit.
2. Withdraw the cable nipple from the catch lever, then compress the small coil spring, pull the cable casing out of its stop, then detach the lock from the cable by withdrawing the cable through the slot in the cable stop.
3. Detach the small "Carr" cable clip securing the cable unit to the underside of the right-hand box-section hinge, then pull the cable unit carefully out of the door tube member.
4. Support the door, then extract the split pin and withdraw the pivot pin securing the rear end of the telescopic stay unit to the bracket on the underside of the door.
5. Remove the four 2 B.A. bolts, shake-proof washers and nuts securing each box-section hinge to the boot door frame, then lift away the door, leaving the hinges in position.

Reverse the foregoing procedure when refitting the door, noting that the bolt holes in the lock attachment brackets are elongated to provide adjustment of lock position, and that the lock must be adjusted to give satisfactory engagement of the catch with the catch plate on the boot sill before the retaining nuts are tightened finally. In addition, if necessary, adjust the cable, at the double-ended cable stop, so that the catch is released by a total cable movement of approximately 0.30in.

Replacing boot door

Complete replacement boot doors cannot be supplied. In the event of damage, every attempt should be made to repair the existing door and, in particular, to

repair the tubular structure. Replacement outer panels can be supplied, and these must be fitted and clinched in position on the repaired structure to suit the boot aperture of the particular car. When ordering a replacement panel, the chassis number must be quoted, since the form of the panel was changed at Chassis No. 696.

SPARE WHEEL STORAGE

Description

The spare wheel is carried in a hinged tray on the underside of the boot, the wheel being held securely in position by three rubber-faced locating strips in the tray and a sponge rubber-faced boss fitted to the underside of the boot floor, the boss locating in the hub aperture of the wheel.

To obtain access to the wheel, the tray locks must first be released from within the boot. Two lock units are fitted, one on each side of the boot. Each unit comprises a toggle handle unit which is connected to an operating link which extends downwards through the boot floor, where it connects via an adjuster fork to a pivoting catch unit bolted to the chassis rear extension, the catch plate embracing a locking pin on the side of the spare wheel tray.

The locks operate in the following manner. As the toggle handles are pulled upwards, the operating links move downwards, thereby rotating the catches about their pivots and releasing the tray. The rear end of the tray then drops downwards, total movement being limited by spring-controlled check units fitted forward of the catch units. A catch assembly and check unit is shown in Fig. 52. When closing the spare wheel storage, lift up the tray by its lifting handle until the catch pins locate in the catches, then press down the toggle handles to their full extent.

Adjusting spare wheel tray catches

The length of the catch operating link is adjustable to compensate for wear in the catch mechanisms. Each link should be adjusted in the following manner :-

1. Open the boot door and pull up the toggle handles to lower the spare wheel tray.
2. Extract one of the split pins from the pin securing the link adjuster fork to the catch; withdraw the pin and detach the fork from the catch.
3. Release the operating link lock-nut, then screw the adjuster fork on the link the required amount to take up the wear in the mechanism, lock the adjustment, then close the stowage and check that an equal amount of pressure must be applied to each toggle handle to move it to the "LOCK" position.






Removing and refitting spare wheel tray

To remove the tray proceed as follows :-







1. Jack up the rear of the car.
2. Open the boot door and operate the toggle handles to lower the spare wheel tray.
3. Lift out the spare wheel.
4. Disconnect the check unit springs, then close the stowage partially and support the tray.
5. Working on the underside of the car, remove the 2 B.A. set-bolt and shake-proof washer locking the tray hinge pins in their housings on each side and towards the front of the tray.
6. Tap out the pins, then lift the tray upwards and rearwards to disengage the tray from the check units and remove the tray from the car.

Reverse the foregoing sequence when refitting the tray.










RUBBER SECTIONS TYPE 400

<p>E. 5620/R117</p>  <p>WINDSCREEN EXTERNAL SEAL. (LATER TYPE WINDSCREENS)</p>	<p>NO PART N^o</p>  <p>WINDSCREEN TUBULAR SEAL. (EARLY TYPE WINDSCREENS)</p>	<p>NO PART N^o</p>  <p>BLACK RUBBER 2 IN. X 1/16 IN. USED AS GLAZING STRIP FOR WINDSCREEN, DOOR FIXED GLASS PANEL, QUARTER LIGHTS AND REAR WINDOW (OPENING TYPE)</p>
<p>NO PART N^o</p>  <p>QUARTER LIGHT FRAME SEAL. MOULDED TO SHAPE ON QUARTER LIGHT.</p>	<p>N. 712001/3</p>  <p>REAR OPENING WINDOW FRAME SEAL.</p>	

RUBBER SECTIONS TYPE 401

<p>N. 712001/1</p>  <p>USED UP TO CHASSIS N^o 625 FOR ITEMS 1 & 2, ON & FROM CHASSIS N^o 626 FOR ITEM 3.</p> <ol style="list-style-type: none"> DOOR DRAUGHT EXCLUDERS & QUARTER LIGHT SEALS. ON CARS WITH LIGHT ALLOY WINDOW FRAMES - LENGTH REQUIRED PER CAR = 35 FT. CARS WITH BRASS DOOR-WINDOW FRAMES = 9 FT-4 IN. PAINTED REAR BUMPER SHOCK-ABSORBER MOUNTED TYPE, BOOT DOOR SEAL, LENGTH REQUIRED PER CAR = 3 FT. REAR BUMPER SPRING BAR MOUNTED TYPE, QUARTER PANEL SEALS, LENGTH REQUIRED PER CAR = 6 FT-6 IN. 	<p>N. 712001/2</p>  <p>USED ON CHASSIS N^o 626 ONWARDS "FURFLEX" COVERED FOR:-</p> <ol style="list-style-type: none"> DOOR PILLAR DRAUGHT EXCLUDER LENGTH REQ'D. PER CAR 9 FT-4 IN. 	<p>N. 712001/3</p>  <p>USED UP TO CHASSIS N^o 285 FOR:-</p> <ol style="list-style-type: none"> WINDSCREEN EXTERNAL SEAL ON CARS WITH LIGHT ALLOY WINDSCREEN FRAMES.
<p>N. 712001/5</p>  <p>USED ON CHASSIS N^o 626 ONWARDS FOR:-</p> <ol style="list-style-type: none"> FRONT BUMPER, SPRING BAR MOUNTED TYPE, TOP SEAL, LENGTH REQ'D. 6 FT-4 IN. REAR BUMPER, SPRING BAR MOUNTED TYPE, TOP SEAL, LENGTH REQ'D. 10 FT. 	<p>N. 712001/6</p>  <p>USED ON ALL TYPE 401 CARS FOR:-</p> <ol style="list-style-type: none"> BULKHEAD UNDERBONNET SEAL. LENGTH REQ'D. 4 FT.-9 IN. BONNET REAR ANGLE. LENGTH REQ'D. 4 FT.-3 IN. 	<p>N. 712001/9</p>  <p>USED UP TO CHASSIS N^o 625 FOR:-</p> <ol style="list-style-type: none"> WINDSCREEN CENTRE PILLAR SEAL ON CARS WITH LIGHT ALLOY WINDSCREEN FRAMES

RUBBER SECTIONS TYPE 401 (CONT'D)

<p>N. 712001/10</p>  <p>USED UP TO CHASSIS Nº 625 FOR:-</p> <ol style="list-style-type: none"> 1. REAR BUMPERS, PLATED TYPE AND PAINTED, SHOCK-ABSORBER MOUNTED TYPE, TOP & BOTTOM SEALS. LENGTH REQ'D. PER BUMPER 10 FT. 2. FRONT BUMPERS, PLATED TYPE AND PAINTED, SHOCK ABSORBER MOUNTED TYPE, TOP SEALS, LENGTH REQ'D. PER BUMPER 6 FT. 	<p>N. 712001/12</p>  <p>USED UP TO CHASSIS Nº 625 FOR:-</p> <ol style="list-style-type: none"> 1. BOOT DOOR LOWER SEAL. LENGTH REQ'D. 2 FT.-6 IN. 	<p>N. 712001/13</p>  <p>USED ON CHASSIS Nº 625 ONWARDS FOR:-</p> <ol style="list-style-type: none"> 1. DOOR WINDOW FRAME DRAUGHT EXCLUDERS. LENGTH REQ'D. PER DOOR 5 FT. 6 IN. 2. QUARTER LIGHT DRAUGHT EXCLUDERS. LENGTH REQ'D. PER. LIGHT 5 FT
<p>N. 712001/16</p>  <p>USED UP TO CHASSIS Nº 625 FOR:-</p> <ol style="list-style-type: none"> 1. DOOR GARNISH RAIL. LENGTH REQ'D. PER DOOR 3 FT.-6 IN. 	<p>NO PART Nº</p>  <p>BLACK RUBBER 2 IN. X 1/16 IN.</p> <p>USED ON ALL CARS AS GLAZING STRIP FOR WINDSCREEN, QUARTER LIGHTS AND REAR WINDOW.</p> <p>NOTE:- GLAZING COMPOUND MAY BE USED AS ALTERNATIVE ON REAR WINDOW.</p>	<p>N. 705202</p>  <p>USED UP TO CHASSIS Nº 625 FOR:-</p> <p>BUMPER CUSHION BEAD ON PLATED TYPE BUMPERS</p> <p>LENGTH REQ'D. PER BUMPER</p> <p>FRONT 2 FT. } (2 OFF)</p> <p>REAR 2 FT.-6 IN. }</p>
<p>N. 705703</p>  <p>SORBO RUBBER SECTION</p> <p>USED ON CHASSIS Nº 1005 ONWARDS FOR:-</p> <ol style="list-style-type: none"> 1. BOOT DOOR SEAL 	<p>N 705201/1</p>  <p>SORBO RUBBER SECTION</p> <p>USED ON CHASSIS Nº 1005 ONWARDS FOR:-</p> <ol style="list-style-type: none"> 1. SPARE WHEEL TRAY SEAL 	<p>N 705609/5</p>  <p>USED ON CHASSIS Nº 286 ONWARDS FOR:-</p> <ol style="list-style-type: none"> 1. WINDSCREEN EXTERNAL SEAL ON CARS WITH BRASS WINDSCREEN FRAMES

RUBBER SECTIONS TYPE 402

THE RUBBER SECTIONS FITTED TO TYPE 401 CARS ARE ALSO FITTED TO TYPE 402 CARS AS INDICATED IN THE FOLLOWING TABLE

	LOCATION	SECTION		LOCATION	SECTION
1	REAR BUMPERS PLATED TYPE AND PAINTED, SHOCK-ABSORBER MOUNTED TYPE, TOP AND BOTTOM SEALS	N. 712001/10 LENGTH REQ'D. PER BUMPER 10 FT.	4	REAR BUMPER, PAINTED, SHOCK ABSORBER MOUNTED TYPE BOOT DOOR SEAL	N. 712001/1 LENGTH REQ'D. 3 FT.
2	FRONT BUMPERS PLATED TYPE AND PAINTED SHOCK ABSORBER MOUNTED TYPE TOP SEAL.	N. 712001/10 LENGTH REQ'D. PER BUMPER 6 FT.	5	BULKHEAD UNDERBONNET SEAL BONNET REAR ANGLE	N. 712001/6 LENGTH REQ'D. 4 FT.-9 IN. LENGTH REQ'D. 4 FT.-3 IN.
3	FRONT AND REAR BUMPERS PLATED TYPE BUMPER CUSHION HEAD	N. 705202 LENGTH REQ'D. FRONT 2 FT. 2 OFF REAR 2 FT.-6 IN. 2 OFF	6	WINDSCREEN GLAZING RUBBER	N. 712001/8 AND RUBBER STRIPS 2 IN. X 1/16 IN.



WORKSHOP MANUAL

Section :- 14

Bulletin No :- 1

Subject :-

BODY TYPE 403 CAR

The information given in Section 14 relating to the latest Type 401 cars is applicable to the Type 403 cars with the exception of the addition of an air re-circulation system. This is described below.

HEATING SYSTEM - RE-CIRCULATION

Provision is made for the re-circulation of warm air for use in very cold weather or when town driving. The existing de-mister system air duct below the facia panelling has been modified as shown in Fig.1 to include a series of ports in the lower face. These are controlled by a ported shutter plate located in runners and controlled by a small lever situated beneath the dashboard adjacent to the steering column. Operation of the lever thus controls a supply of warm air which is reflected downwards.

The control lever is of light alloy and will not withstand the application of undue force; it is therefore important to make sure that the shutter moves freely. Check this at regular intervals and lubricate when necessary. Should the shutter plate become tight, remove the self-tapping securing screws, withdraw the shutter plate then clean and re-grease both the plate and runners.

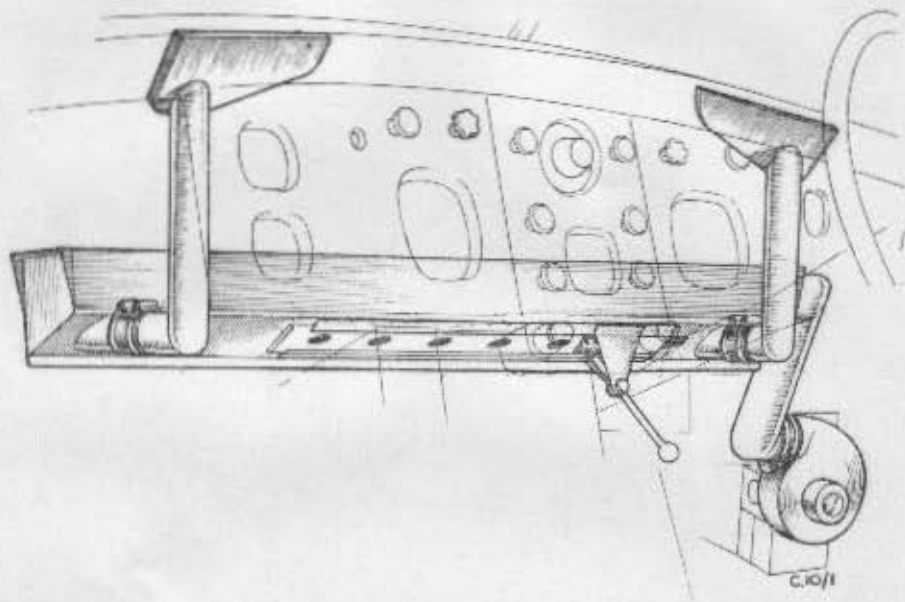


Fig. 1. Diagram of Re-circulation System



WORKSHOP MANUAL

Section :- 14

Bulletin No :- 2

Subject :-

MODIFICATION TO EARLY TYPE WINDSCREEN
FITTING ON CAR TYPE 400 TO ACCEPT THE
LATER TYPE OF EXTERNAL SEALING RUBBER.

INTRODUCTION

1. When water leakage is encountered on the early type fitting of the windscreen in the type 400 car, it is recommended that the screen fitting is modified to accept the later improved type of external sealing rubber. The two types are shown in section in Fig. 11 on page 22 of this section. It will be noted that the screen frame must be brought forward by approximately half its depth. The work entailed is as follows :-

- (1) Removing the windscreen complete from the car.
- (2) Removing the existing sealing rubber from the channel around the frame.
- (3) Making up and riveting extension pieces to the existing attachment angles on the screen frame.
- (4) Fitting the later type sealing rubber to the channel around the frame.
- (5) Drilling a hole in each lower corner of the screen aperture of the car and fitting copper drain pipes.
- (6) Removing the interior scuttle facings, drilling a hole in a body panels, connecting a rubber tube to the drain pipes fitted and leading them outside the car.
- (7) Fitting a wood packing support to each side channel of the screen aperture.
- (8) Refitting the windscreen and fitting a strip of "Furflex" draught excluder around the interior edge of the screen frame.

Note:- It is most important that this work is carried out carefully and accurately, in particular the two following operations.

- (a) The making and fitting of the angle piece extensions, in order to avoid "stressing" the screen with the consequent likelihood of the glass splitting.
- (b) Drilling the holes to receive the drain pipes, in order to avoid running the drill into the outer panel or to cause kinking of the rubber pipe and so blocking an effective exit.

PROCEDURE

2. Work on the windscreen frame

- (1) Remove the windscreen as detailed on pages 21 and 23 of this section.
- (2) Remove the existing sealing rubber from the channel around the windscreen frame. Discard the sealing rubber.
- (3) Make up the extension pieces (item 1) and carefully rivet one to the inner face of each attachment angle on the screen frame. See Fig. 1 of this Bulletin.
- (4) Fit the new sealing rubber (item 3) to the channel around the screen frame as follows :-

Starting from the top centre, push home about 3in. of the front edge of the rubber into the front-facing side of the channel, then with a suitable tool carefully work in the rear edge. Continue all round the frame, ensuring that the rubber is fully home and even. Finally make sure that the two ends abut squarely and firmly, then staple the two mating 'flaps' together with an office-type paper stapling implement.

3. Work on the car body

- (1) Clean out all traces of "dum-dum" composition from the screen aperture channel.
- (2) Make up two wood packing pieces (item 4) and fit one to each side within the channel of the screen aperture as shown in Fig. 2 of this bulletin. These packings must be so fitted as to give support to the joints in the side members of the windscreen frame when the frame is in position. At the same time the depth from the front to rear must be such that the side members of the windscreen frame are supported on the packings. The necessary measurement of depth varies slightly from car to car and the packing pieces must be fitted individually.

-3-

- (3) Drill a 5/16in. dia. hole at the point indicated in Figs. 2 and 3 in the right and left hand bottom curve of the screen channel.

Note:- This drilling must be done very carefully so that the drill "breaks out" of the front face of the timber without striking the top scuttle paneling, but at the same time will allow the rubber tubing subsequently fitted to the inserted copper pipes to have a clear run without kinking. The clearance space in this area varies from car to car and must be done to suit the individual car.
- (4) Carefully beat down the metal surrounding the hole with a ball pein hammer or suitable punch to give a slight sink, clean up the beaten area and tin it with solder, as shown in Fig. 3.
- (5) Cut two 3in. lengths of 5/16in. outside diameter copper pipe and drive the pipes into the holes drilled at operation (3). Carefully beat the top end to a bell mouth as shown in Figs. 1 and 3 and, with a soldering iron and a small amount of solder, seal the outside surround of the pipe.
- (6) Unscrew and remove the left and right hand scuttle ventilator control knobs, then prise the interior scuttle facings from their locations and remove them.
- (7) From inside the car, drill a 3/8in. diameter hole in the outer body panel 7in. below the front face of each ventilator grille, and clean up any burrs left by the drill. The holes will emerge into the front wheel arch beneath each front wing and aft of the wheels.
- (8) Attach a length of 5/16in. diameter rubber tubing to each drain pipe inserted at operation (5). Carry the tubing around the front face of each ventilator grille and lead it through the hole drilled at operation (7). Cut the tube to leave about 3in. protruding into the wheel arch.
- (9) Refit each interior scuttle facing and refit the ventilator control knobs.
- (10) Fit the windscreen frame into position and secure it with the original screws through the vacant hole in each angle piece extension.
- (11) Fit the "Furflex" draught excluder strip around the inside of the frame with the two ends meeting at the top of the centre division. Cut the securing flap as necessary to form the curves, and secure the flap to the trimming strip locations with upholsterers solution so that the roll fills the small gap which now exists between the screen frame and the body aperture.
- (12) Refit the top, bottom and side finishers and secure with the original "Parker-Kalon" screws.

Note:- Ensure that the cut-away over each angle piece extension in the bottom finisher is sufficient to clear the extensions, otherwise the finisher will not lie flush.

PARTS REQUIRED

<u>Item No.</u>	<u>Description</u>	<u>Part No.</u>	<u>No. required</u>
1.	Angle piece extension.	To be made	14
2.	Al. rivet c/s Hd $\frac{1}{4}$ in. long x $\frac{3}{16}$ in. dia.	-	14
3.	Sealing strip.	E. 5620/R117	1 length 10ft.
4.	Wood packing piece $\frac{3}{4}$ in. x $\frac{1}{4}$ in. x 7in. long.	To be made to suit.	2
5.	Copper pipe $\frac{1}{4}$ in. long x $\frac{5}{16}$ in. dia.	To be cut.	2
6.	Rubber tubing $\frac{5}{16}$ in. dia.	-	2 lengths 3ft. ea.
7.	"Furflex" draught excluder. (Colour to match upholstery).	-	1 length 10ft.

Items 3 and 7 only can be obtained from the Spares Dept., Car Division, Bristol Aeroplane Company, Limited.

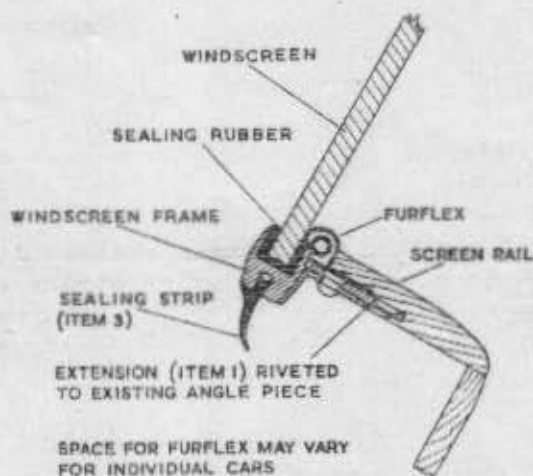
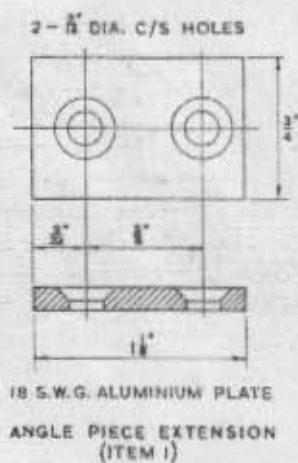


FIG.1.

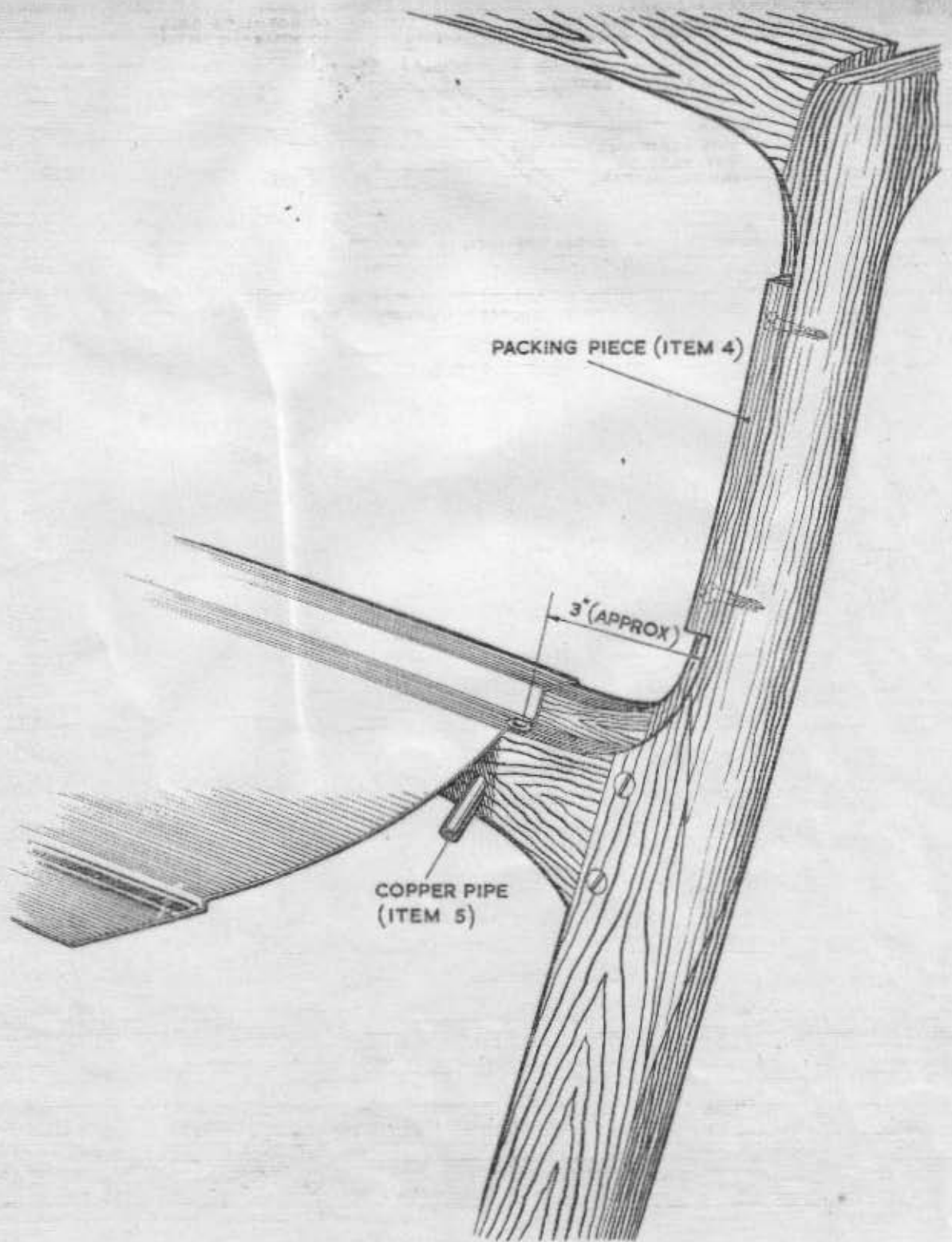
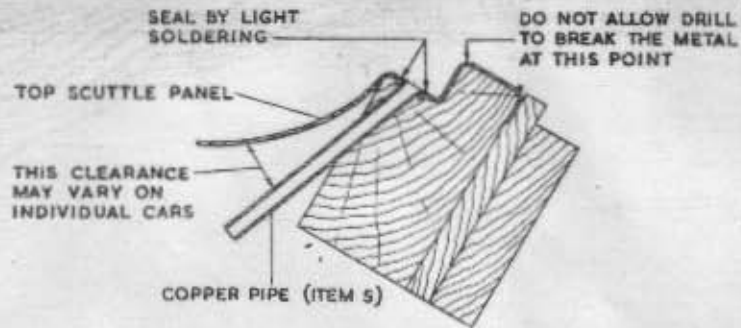


FIG. 2.



FITTING OF COPPER DRAIN PIPE IN LOWER RAIL
OF WINDSCREEN APERTURE IN BODY

FIG.3.



WORKSHOP MANUAL

Section:- 14

Bulletin No:- 3

Subject:-

FITTING AN ANTI-RATTLE SECONDARY SPRING ATTACHMENT
BRACKET TO THE REAR QUARTER LIGHT TOGGLE FASTENERS
ON TYPE 401 CARS AND EARLY TYPE 403 CARS

INTRODUCTION

1. In order to eliminate rattle in the toggle fasteners of the rear quarter lights, all the above cars may be fitted with a secondary spring attachment bracket as illustrated in this bulletin.

Although it is possible to fit these attachment bracket springs by releasing only the end of the toggle fastener secured to the hinged light frame, this is not recommended since unsightly damage is sustained by the fixture screws.

PROCEDURE

2. (1) Open the rear quarter light to its full extent then remove the toggle fastener by first releasing the three screws securing the body attachment plate to the car body, followed by the two screws securing the attachment bracket to the hinged light frame.
- (2) Fit the secondary spring attachment bracket (item 1) to the inside curve of the attachment bracket (item 2) by slipping the plain end beneath the distance piece round which the existing attachment bracket pivots as shown in the illustration. Align the screw holes and refit the assembly.

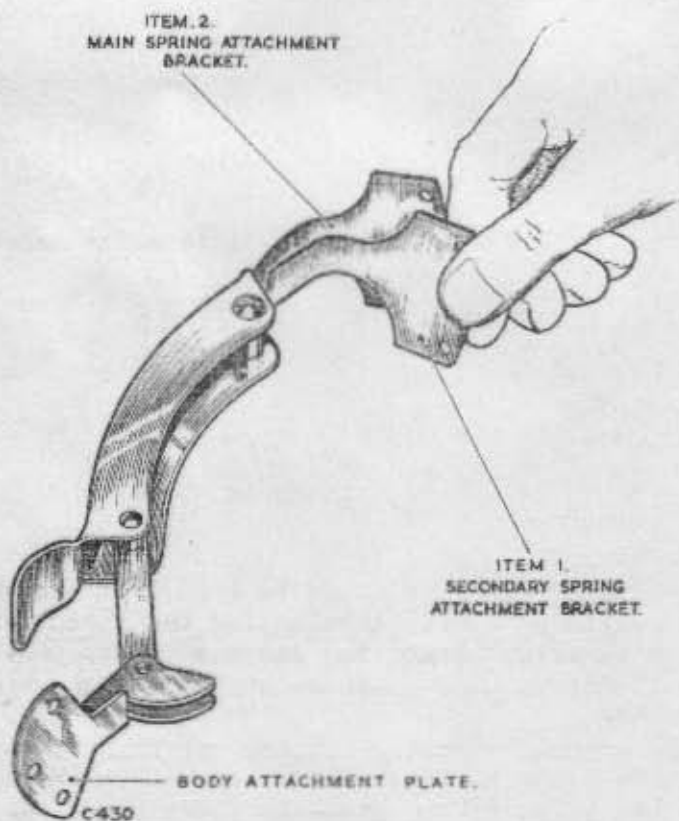
The inner spring can, as stated above, be fitted to the existing spring but it is preferable to fit a complete inner and outer spring which have been paired.

PARTS REQUIRED

<u>Item No.</u>	<u>Description</u>	<u>Part No.</u>	<u>No. Reqd.</u>
1	Secondary spring attachment bracket.	N. 705817	2

Optional

2	Main spring attachment bracket.	N. 705574	2
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WORKSHOP MANUAL

Section :- 14

Bulletin No:- 4

Subject :-

FITTING SIDE SUN VISORS TO LATER
TYPE 401 CARS AND ALL TYPE 403 CARS.

INTRODUCTION

Mounting plates have been introduced into the roof structure of the following cars to allow for the fitment of a 24in. sun visor to both the driver's and the front passenger's side above the doors.

Type 401 Cars from chassis 906 onwards.

Type 403 Cars all cars.

PROCEDURE

1. Referring to Fig.1 and Fig.2, measure 2in. on the roof lining forward of the rear door pillar line. Using hard hand pressure, locate the bracket behind the roof lining and check that the 2in. dimension is approximately central with it. If not, adjust the distance accordingly and lightly mark the centre line.
2. Lightly mark a horizontal line $2\frac{1}{2}$ in. above the door frame finisher on the vertical line and also about 24in. forward of it.
3. With the sun visor in its closed position, locate the rear fixture bracket screw holes over the vertical centre line and align the centre of the sun visor horizontally with the $2\frac{1}{2}$ in. line. Check that the visor does not protrude below the door frame and raise if necessary.

4. Mark off the top rear hole through the sun visor bracket, remove the sun visor and, pressing the roof lining hard against the bracket, drill through the lining and bracket with a No.32 Drill (0.116in.). A short drill is recommended to avoid the possibility of drilling through the roof.
5. Locate the visor and screw into position, locating on the drilled hole. With the visor in its final position, drill the top front hole and fit the screw in position and then finally drill the lower holes and fit the other screw.
6. Repeat the foregoing process on the other side of the car.

PARTS REQUIRED

<u>Item No.</u>	<u>Description</u>	<u>Part No.</u>	<u>No. reqd.</u>
1	Sun Visor Assembly.	N. 705735	2
2	Screw No.6 x $\frac{5}{8}$ in. long. Phillips recess Type Z-chrome. Raised head.	-	4

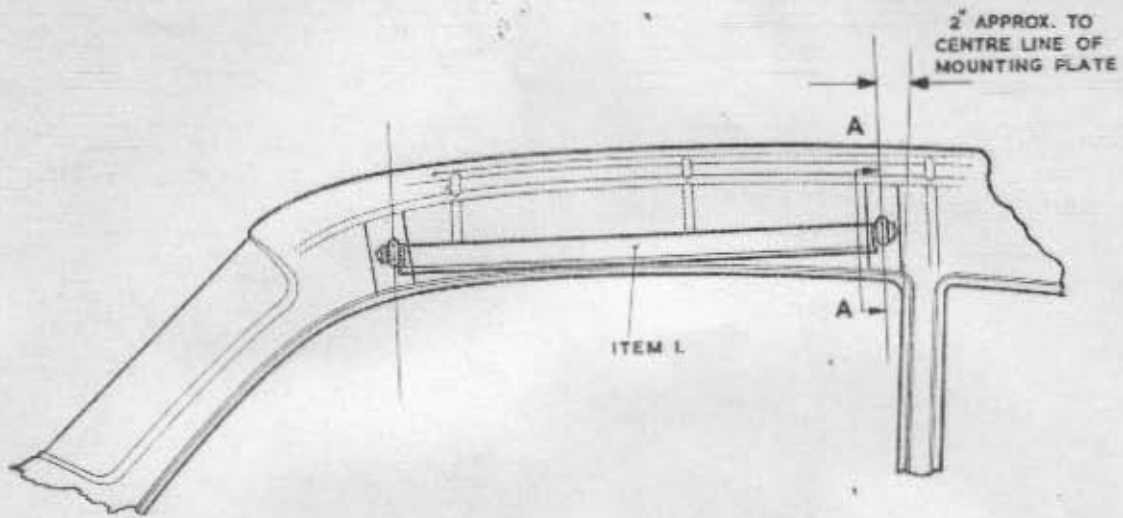


FIG 1.

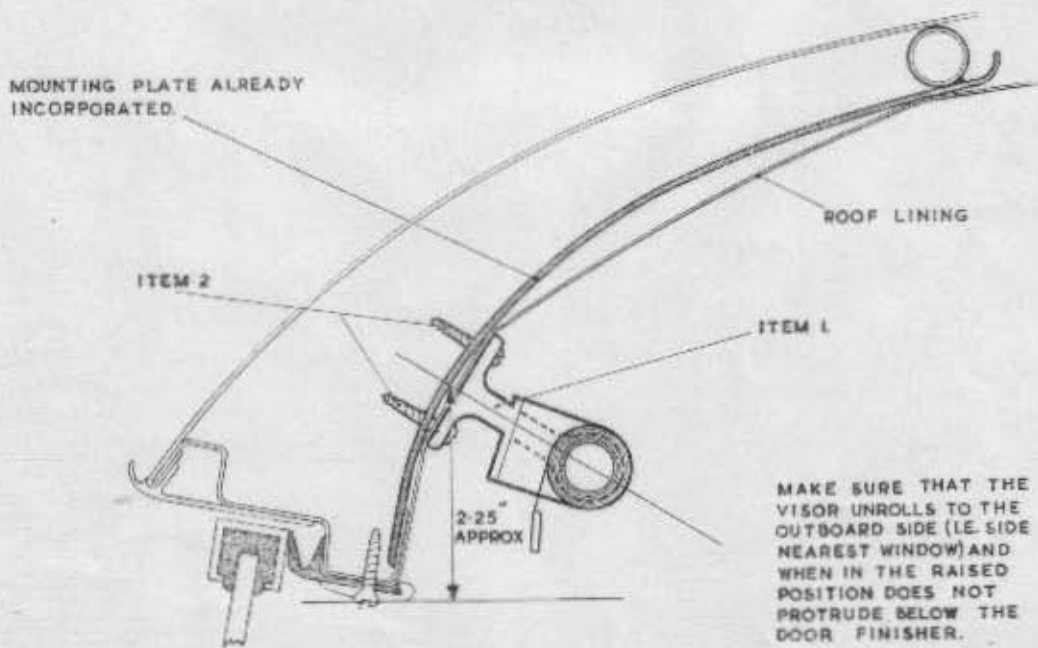


FIG 2 (SECTION AA OF FIG 1.)

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